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Royal Favour

IT is a source of great satisfaction to all concerned with aviation in this country and the Commonwealth that our Royal Family take such a keen and active interest in all branches of flying. In the last 18 months in particular, many most important functions have been honoured by the presence of the King, Queen and Princesses, and the readiness of Their Majesties to fly in the Vikings of the King's Flight on all appropriate occasions shows their confidence in aircraft as a speedy means of personal transport.

The most recent honour to Service aviation (recorded elsewhere in this issue)—the acceptance by the Queen, with the King's approval, of the appointment of Honorary Air Commodore to No. 600 (City of London) Squadron and of No. 2600 (City of London) Light Anti-Aircraft Squadron—is without precedent in the history of the Royal Auxiliary Air Force. Last summer, in quite another field, the Queen gave immense encouragement to the model aircraft movement when, accompanied by Princess Margaret, she attended one of their important flying meetings.

The King (who took a course of instruction as pilot at Wallington, near Croydon, in 1919) further enhanced the status of the Royal Air Force College, Cranwell, when last year he personally presented to the College the King's Colour, the first to be received by the Royal Air Force. In February this year, the Royal Aeronautical Society, in which the King has been interested for 30 years and of which he has been patron since 1922 (he was then Duke of York), was granted a Royal Charter.

Again, no greater distinction could have been bestowed upon an aeronautical body than the acceptance by Princess Elizabeth of the Grand Mastership of the Guild of Air Pilots and Air Navigators. At the ceremony marking the occasion Her Royal Highness delighted all to whom she spoke by her knowledge of aeronautical matters.

At the recent National Air Races, in spite of the spectacular nature of some of the newer events, it was to the classic race for the King's Cup that pride of place was unquestionably accorded. Moreover, it was with genuine regret that spectators saw the aircraft entered by Princess Margaret eliminated by a narrow margin.

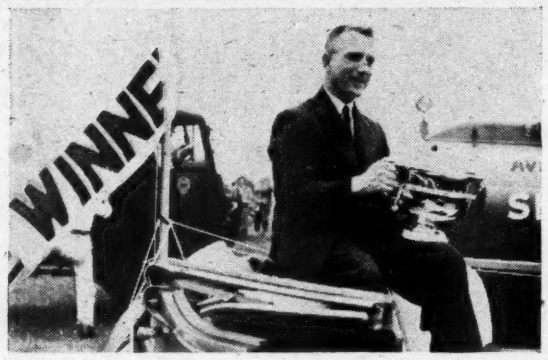
Few of us, magically given the opportunity, would care to assume the manifold responsibilities so graciously borne by our Royal Family; that so large a proportion of their formidable engagement list is devoted to aviation affairs is indeed an inspiration to a still comparatively young movement and industry.

Farnborough at Hand

WITH astonishing rapidity, it seems, a year has passed and British aviation's great annual event—the Display and Exhibition of the Society of British Aircraft Constructors—is a bare month ahead. Remarkable progress has again been made since the previous Show, and a number of completely new aircraft are to be present, some of which, being secret, have yet to be announced. Of the 59 machines expected to fly at Farnborough no fewer than 24 are turbine-powered, and 12 of them will be making a first appearance. Three outstanding types, the demonstration of which is eagerly awaited, are the Canberra, Britain's first jet bomber; the Comet, first four-jet airliner in the world; and the Hermes V turboprop airliner. These matchless products will be supported by many others.

An indication that greater and greater thrust is required from military power units is afforded by the incorporation of afterburners in two of the standard types of jet fighter to be demonstrated. Afterburning (or re-heat) is no new development over here, although lately much more has been heard in America of this method of boosting thrust for short periods. In this country, turbojets such as the axial Avon, delivering in excess of 6,000 lb thrust, should provide adequate power for immediate requirements. Some news of British rocket motor developments for missiles and take-off assistance may also be forthcoming at Farnborough.

Both for the British and foreign technical visitors and for the general public (who will be admitted on the two final days) Farnborough '49 promises to be a memorable affair and a worthy culmination of a year's endeavour.



ELMDON ECHOES

IT is now possible to look back on the first British National Air Races and to consider the successes and shortcomings of the Bank Holiday week-end of flying at Elmdon. Last week we presented an immediate report on the individual events and a brief word-picture of all that went on. Now a more detailed list of results and speeds (on page 152) can be given, a further selection of photographs presented, and some praise bestowed.

There were two big disappointments, the first to a considerable extent responsible for the second; weather was at best mediocre, and for the opening days the attendance was very small. Fortunately, on the Monday there was a great—even remarkable—improvement, and in spite of dull, cloudy weather more than 100,000 were present.

One most heartening aspect of the whole meeting was the tremendous enthusiasm shown by the competitors and all those associated with the aircraft and the organization. For the arrangements and organization themselves we can give unqualified praise. Everything went most smoothly, safely and without delay, and provision was made for every contingency although, no doubt, some lessons were learned.

(First column, top to bottom) : F/O. W. Bowden (Spitfire 22), of No. 502 (Ulster) Squadron is congratulated on winning the R.Aux.A.F. Race : F. Dunkerley seated in the triumphal car after winning the Siddeley Challenge Trophy for the Lancashire Aero Club in a Gemini at 144.5 m.p.h. : D. A. Arch (Auster Autocrat), Grosvenor Trophy winner at 112.5 m.p.h. : and P. G. Lawrence (Firebrand 5a), who won the Air League Cup at 302 m.p.h. (Second column, top) : " Wimpey " Wade is congratulated by Mr. A. N. Spriggs, works director of Hawker Aircraft, Ltd., after his 510 m.p.h. S.B.A.C. Cup victory in the P.1040. (Second column, bottom) : Neville Duke talks to a previous King's Cup winner, H. S. Broad, before winning the Kemsley Trophy in the P.1040 at 508 m.p.h. A photograph of J. N. Somers, King's Cup winner, appeared last week.

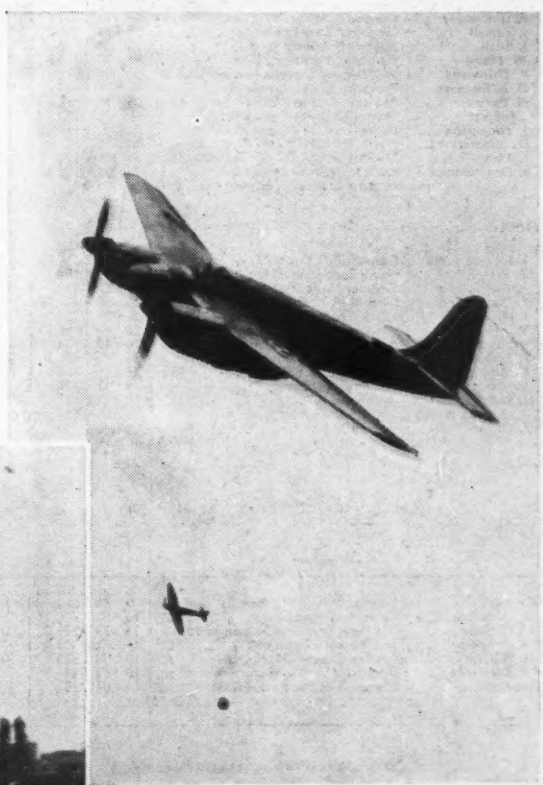
(Left) : Jan Anderle, Czech pilot of the Aero 45, with his daughter after winning the Norton Griffiths Trophy at 163 m.p.h. (Below) : John Derry's D.H.108 generates compressibility vapour in the S.B.A.C. Race, which was flown in appalling weather.

Further Observations on the National Air Races : Times, Speeds and Placings in Detail

(Illustrated by "Flight" Photographs)

The course came in for some criticism ; but, on the whole, and bearing in mind the great differences in speed between the various races, it would have been difficult to provide a better spectacle. The siting of the pylons was deservedly criticized, and the pylons themselves, in the prevailing weather, were not as easy to see as they might have been. If the Dunlop company are again generous enough to provide pylons they will, no doubt, make some modifications. Sodium flares beside the pylons were a great help to the high-speed pilots—Cunningham, Wade, Duke, Derry and others—who pressed gallantly on, rather than disappoint the crowd, in extremely unpleasant weather conditions.

The standard of flying and flying discipline was very high, and thanks to excellent handicapping there were several most exciting bunched finishes. The Ministry of Supply, whose representatives were present at Elmdon, earned the gratitude of all spectators for allowing the Service and research aircraft to take part in the races, and the enterprise of the several manufacturers who gave their full support will not be overlooked. Tabulated results and more illustrations appear overleaf.



(Above) : T. W. Brooke-Smith's Short Sturgeon I takes a turn in the Air League Cup, with G/C. A. H. Wheeler's Spitfire 5 in the offing. P. G. Lawrence (Firebrand 5a) was the eventual winner, A. E. Gunn (Balliol 2) and Morrell (Sea Fury Trainer) having missed pylons. (Left) : The Autocrat flown by D. A. Arch crosses the finishing line to win the Grosvenor Trophy from Mole's Bibi and Lawrence's old B.2 trainer

Elmdon Results in Detail . . .

THE KING'S CUP AIR RACE

HEAT 1

Pilot	Aircraft and Engine	Net F.T.	Speed	Pos.
		m. s.	m.p.h.	
J. Somers	Gemini III (2 Gipsy Major 1c)	22 40	165	1
R. Paine	Hawk Speed Six (Gipsy Six If)	20 10	185.25	2
A. L. Cole	Comper Swift (Pobjoy R)	29 39	126	3
W. Fillingham	D.H. Chipmunk (Gipsy Major X)	26 44	139.25	4
F. Weir Willats	Proctor I (Gipsy Queen II)	25 09	148.5	5
W. Stuart	Proctor III (Gipsy Queen II)	25 37	145.75	6
A. McDowall	Hawk Trainer III (Gipsy Major I)	30 06	124	7
T. Rose	Gemini IA (2 Cirrus Minor II)	26 32	141	8
Miss R. Sharpe	Miles Mercury IV (Gipsy Major IIa)	26 13	142.5	9
E. Morton	Miles Messenger IVa (Gipsy Major Id)	30 20	123	10
P. Lawrence	Miles Messenger III (Cirrus Major III)	30 16	123.5	11

Fastest Lap : R. Paine, 6 min. 26 sec, 189.25 m.p.h.

HEAT 2

Pilot	Aircraft and Engine	Net F.T.	Speed	Pos.
		m. s.	m.p.h.	
J. Milli	Hawk Trainer III (Gipsy Major)	29 00	128.75	1
C. Alington	Sparrowhawk (Gipsy Major I)	22 56	163	2
J. Oliver	Gemini IA (2 Cirrus Minor II)	26 26	141.25	3
T. Brooke-Smith	Sealand (2 Gipsy Queen 70)	22 13	168.5	4
D. Jemmett	Proctor I (Gipsy Queen II)	25 34	146.25	5
W. Bowles	Messenger IIa (Cirrus Major III)	29 23	127	6
R. Moss	Mosscraft M.A.2 (Cirrus Minor I)	31 08	120	7
J. Wallens	Nighthawk (Gipsy Six II)	24 58	150	8
W. Breen-Turner	Messenger IIA (Cirrus Major III)	29 10	131	9
J. Findlay	Hawk Trainer III (Gipsy Major I)	28 30	126.75	10
C. Nepean-Bishop	Hawk Trainer III (Gipsy Major I)	29 02	128.75	11
A. Bradshaw	Proctor V (Gipsy Queen II)	27 33	135.75	12

Fastest Lap : T. Brooke-Smith, 7 min 05 sec, 172 m.p.h.

HEAT 3

		m. s.	m.p.h.	
W. Lashbrook	Proctor III (Gipsy Queen II)	24 19	153.75	1
F. Dunkerley	Gemini IA (2 Cirrus Minor II)	26 17	142	2
J. Turnill	Mentor (Gipsy Queen I)	25 02	149.25	3
J. Rush	Falcon Six (Gipsy Six I)	23 38	158	4
W. Moss	Mosscraft I (Niagara III)	29 29	126.5	5
P. Townsend	M. Whitney Straight (Gipsy Major I)	28 44	130	6
D. B. Bennett	Proctor I (Gipsy Queen II)	25 17	147.5	7
H. Purvis	Proctor V (Gipsy Queen II)	25 18	147.5	8
I. Fossett	Dove I (2 Gipsy Queen 70)	19 26	192	9
J. Thompson	Hawk Trnr. III (Gipsy Major I)	32 14	115.25	10
D. Jemmett	Hawk Trnr. III (Gipsy Major Ic)	28 22	132	11
L. Hamp	Messenger IVA (Gipsy Major Ia)	31 07	120	12
J. G. Crammond	Heck IIC (Gipsy Queen III)	25 38	145.5	13

Fastest Lap : I. Fossett, 6 min 11 sec, 197 m.p.h.

FINAL

		m. s.	m.p.h.	
J. Somers	Gemini III (2 Gipsy Major 1c)	22 46	164.25	1
R. Paine	Hawk Speed Six (Gipsy Six If)	20 17	184	2
A. Cole	Comper Swift (Pobjoy R)	29 37	126	3
F. Dunkerley	Gemini IA (2 Cirrus Minor II)	26 00	143.75	4
J. Milli	Hawk Trnr. III (Gipsy Major I)	29 00	129	5
W. Fillingham	Chipmunk (Gipsy Major 10)	26 47	139.5	6
W. Lashbrook	Proctor III (Gipsy Queen II)	24 15	154	7
J. Turnill	Mentor (Gipsy Queen I)	24 48	150.5	8
C. Alington	Sparrowhawk (Gipsy Major I)	22 50	163.5	9
W. Moss	Mosscraft I (Niagara III)	29 12	128	10
J. Rush	Falcon Six (Gipsy Six I)	23 23	160	11
T. Brooke-Smith	Sealand (2 Gipsy Queen 70)	22 06	169	12
J. Oliver	Gemini IA (2 Cirrus Minor II)	26 40	140	13

Fastest Lap R. Paine, 6 min 31 sec, 187.25 m.p.h.

KEMSLEY CHALLENGE TROPHY RACE

Pilot	Aircraft and Engine	Net F.T.	Speed	Pos.
		m. s.	m.p.h.	
N. Duke	Hawker P.1040 (1 Nene 2)	9 45	508	1
J. Cunningham	Vampire 3 (Goblin 4)	10 32	480	2
F. Murphy	Sea Fury Trainer (Centaurus 18)	14 35	339.5	3
A. Wheeler	Spitfire 5b (Merlin 45 M)	15 32	319	4
J. Morgan	Spitfire Trainer (Merlin 66)	15 28	320	5
P. Lawrence	Firebrand 5a (Centaurus 9)	16 42	296.5	6
R. Jamieson	Hornet 3 (2 Merlin 134/135)	14 04	352	7

Fastest Lap : N. Duke, 2 min 10 sec, 562.569 m.p.h.

R.AUX.A.F. INTER-SQUADRON RACE

Pilot	Aircraft and Engine	Net F.T.	Speed	Pos.
		m. s.	m.p.h.	
F/O. W. Bowden	Spitfire 22 (Griffon)	15 15	325	1
F/O. E. Smith	Vampire 1 (Goblin)	11 06	446	2
F/O. A. Mercer	Spitfire 22 (Griffon)	14 58	331	3
S/L. H. Dundas	Spitfire 16 (Merlin)	15 53	312	4
Plt. I R. Yule	Spitfire 16 (Merlin)	15 58	310	5
F/O. J. Baxter	Spitfire 22 (Griffon)	15 42	215	6

Fastest Lap : F/O. Smith, 2 min 31 sec, 487 m.p.h.

SIDDELEY CHALLENGE TROPHY RACE

Pilot	Aircraft and Engine	Net F.T.	Speed	Pos.
		m. s.	m.p.h.	
F. Dunkerley	Gemini IA (2 Cirrus Minor II)	25 51	144.5	1
E. Ross	Hawk Trainer (Gipsy Major I)	31 02	120	2
R. Jackson	Autocrat (Cirrus Minor II)	33 01	113	3
D. Jemmett	Hawk Trainer (Gipsy Major I)	29 46	125.5	4
Miss E. Curtis	Proctor III (Gipsy Queen II)	25 21	147.25	5
P. Heppell	Autocrat (Cirrus Minor II)	33 20	112	5
E. Morton	Messenger IVa (Gipsy Major Id)	30 30	122.5	7
J. Somers	Hornet Moth (Gipsy Major I)	31 50	117.5	8
R. Evans	Taylorcraft (Cirrus Minor I)	34 48	107.25	9
G. Watson	Hawk Trainer (Gipsy Major I)	28 34	130.75	10
K. Lalonde	Autocrat (Cirrus Minor II)	33 51	110.25	11
Martin Sharp	Tiger Moth II (Gipsy Major I)	37 04	100.75	12

Fastest Lap : Miss E. L. Curtis, 8 min 07 sec, 150.5 m.p.h.

NORTON GRIFFITHS CHALLENGE TROPHY RACE

Pilot	Aircraft and Engine	Net F.T.	Speed	Pos.
		m. s.	m.p.h.	
Jan Anderle	Aero 45 (2 Walter Minor)	22 54	163	1
J. Rush	Falcon Six (Gipsy Six I)	23 25	159.5	2
H. Purvis	Proctor V (Gipsy Queen II)	25 11	148.25	3
W. Stuart	Proctor III (Gipsy Queen III)	25 29	146.5	4
J. Wallens	Nighthawk (Gipsy Six II)	24 46	151	5
F. Duperre	Norécrin (Regnier 4LO)	22 59	162.5	6
T. Rose	Gemini IA (2 Cirrus Minor II)	26 52	139	7
P. Gallay	Norécrin (Regnier 4 LO)	23 23	160	8
L. W. Hamp	Messenger IVa (Gipsy Major Ia)	31 19	119.25	9
E. Morton	Messenger IVa (Gipsy Major Id)	31 10	120	10
P. G. Lawrence	Messenger III (Cirrus Major III)	30 42	121.5	11
A. J. Bradshaw	Proctor V (Gipsy Queen II)	28 03	133	12
J. Mollison	Cygnet II (Gipsy Major I)	33 54	110	13
J. Oliver	Gemini Ia (2 Cirrus Minor II)	29 04	128.5	14
W. Bowles	Did not complete course			N.F.
J. Somers	Started but completed no laps			N.F.

Fastest Lap : Jan Anderle, 7 min 11 sec, 169 m.p.h.

AIR LEAGUE CHALLENGE CUP RACE

Pilot	Aircraft and Engine	Net F.T.	Speed	Pos.
		m. s.	m.p.h.	
P. Lawrence	Firebrand 5a (Centaurus 9)	16 23	302	1
G. H. Pike	Hornet 3 (2 Merlin 134/135)	14 03	352	2
A.Wheeler	Spitfire 5b (Merlin 45m)	15 47	314	3
T. Brooke-Smith	Sturgeon P.R.1 (2 Merlin 140 SP)	16 48	295	4
A. Gunn	Balliol T.2 (Merlin 35)	21 07	234.5	5
E. Morell	Started but completed no laps			

Fastest Lap : G. H. Pike, 3 min 19 sec. 369 m.p.h.

THE GROSVENOR CHALLENGE TROPHY RACE

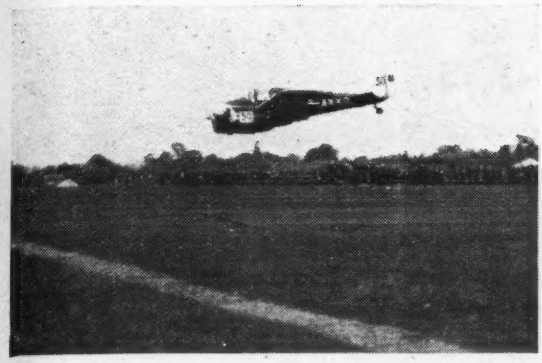
Pilot	Aircraft and Engine	Net F.T.	Speed	Pos.
		m. s.	m.p.h.	
D. Arch	Autocrat (Cirrus Minor II)	22 23	112.5	1
E. Mole	Bibi BE 550 (2 Mikron II)	24 05	104.5	2
P. Lawrence	Blackburn B.2 (Cirrus Major III)	23 02	109.5	3
H. Hughes	Tiger Moth (Gipsy Major I)	24 36	102.5	4
G. Donaldson	Taylorcraft (Cirrus Minor I)	24 10	104.25	5
Karel Vanke	Sokol M.1 D	18 01	140	6
A. Harrison	Auster V (Lycoming)	22 27	112.25	7
A. Moore	Saab Safir (Gipsy Major 10)	17 23	145	8
W. Evans	Tiger Moth (Gipsy Major I)	23 40	106.5	9
D. McCaskill	Auster V (Lycoming)	22 52	110.25	10
Miss E. Curtis	Ercoupe L.15 (Continental) C.75	22 25	112.5	11
T. Leadbetter	Auster V (Lycoming)	23 07	109	12
H. Bilbrough	Chilton D.W.1 (Carden Ford)	26 33	95	13
J. Blunden	Piper Cub J.3 (Continental A.40)	36 47	68.5	14
R. Bradley	Globe Swift (Continental C-125)	21 01	120	15
J. Oliver	Started but completed no laps			N.F.

Fastest Lap for aircraft under 500 kg : Miss Curtis 10 min 35 sec, 126.5 m.p.h.
Fastest Lap for aircraft of 501-1,000 kg : A. R. Moore, 7 min. 45 sec, 157 m.p.h.

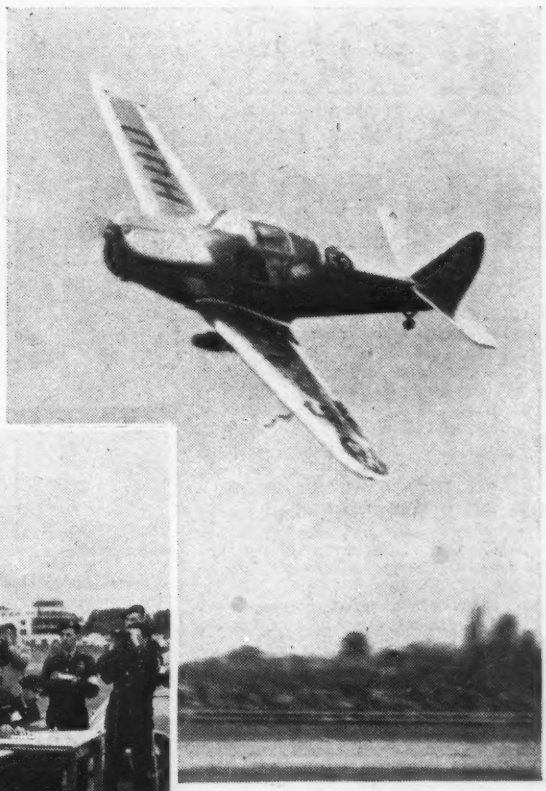
S.B.A.C. CHALLENGE CUP RACE
(Showing individual lap times)

Pilot, Aircraft	Lap 1	Lap 2	Lap 3	Lap 4	Net F.T.	Speed	Pos.
	m. s.	m. s.	m. s.	m. s.	m. s.	m.p.h.	
T. Wade, Hawker P.1040 (Nene 2)	3 09	2 10	2 12.8	2 11.4	9 43.2	510	1
J. Cunningham, Vampire 3 (Goblin 4)	3 26	2 22	2 21.2	2 22.2	10 31.4	470	2
J. Derry, D.H. 108 (Goblin 4)	3 28	2 17	2 11.2	2 12.2	10 08.4	488	3

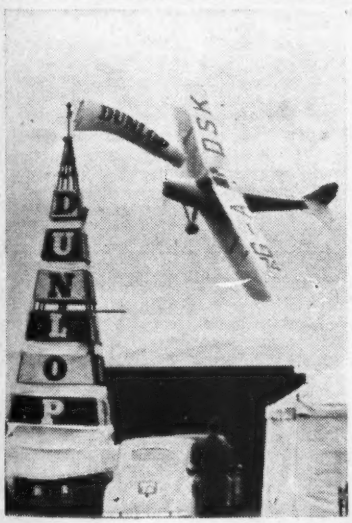
Fastest Lap : T. Wade, 2 min 10 sec, 562.567 m.p.h.



(Above) : F. Dunkerley (Gemini) crosses the line in the Siddeley Trophy race : E. Ross and R. L. Jackson were close behind.



(Above) : R. S. Bradley (Globe Swift) completed the course of the Grosvenor Race with wheels not fully retracted. (Left) : Handicappers and judges—Messrs. Rowarth and Dancy are seen on the left—rest between races in company with R.O.C. personnel.



(Above) : One of the now rarer types—the Hornet Moth flown by J. N. Somers in the Siddeley Trophy Race. (Right, upper) : Miss Curtis (Ercoupe), taxies in from the Grosvenor Trophy contest. (Right, lower) : Two French Norécrins competed in the Norton Griffiths trophy. This one, flown by Duperré, finished sixth at 162.5 m.p.h.

HERE AND THERE

Defence College Commandant

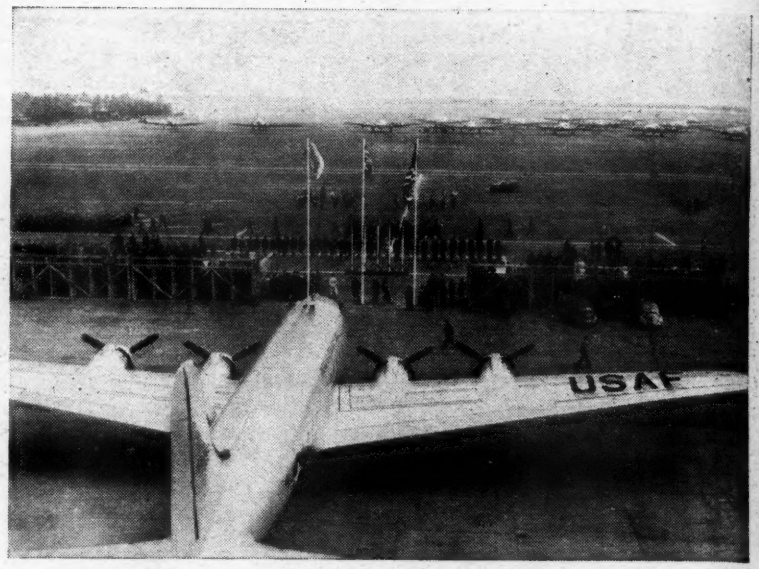
VICE-ADMIRAL SIR CHARLES DANIEL, who, until May, was Third Sea Lord, is to succeed Air Chief Marshal Sir John Slessor as Commandant of the Imperial Defence College on Sept. 19th. As already announced, Sir John becomes Chief of the Air Staff on Jan. 1st.

R.Ae.S. Commonwealth Lecture

MR. E. H. ATKIN, F.R.Ae.S., chief designer, airframe division, A. V. Roe (Canada), Ltd., is to deliver the Fifth British Commonwealth and Empire Lecture of the Royal Aeronautical Society. It will be given at the Institution of Civil Engineers, London, at 6 p.m. on Thursday, September 15th.

Australian Caterpillars

IN Australia, the counterpart of the famous Caterpillar Club (the qualification for which is an emergency parachute drop) is known as the Roo Club; it is sponsored by the Dominion Parachute Company. Badge No. 126 was recently presented to a pilot of No. 77 R.A.A.F. Squadron, while another aircrew member was awarded an engraved parachute packing stick for his second jump in 12 months.



HONOURING AIR LIFT VICTIMS: A combined Allied memorial service, attended by leading members of the Western Occupational Powers, held recently was at Fassberg, in the British Zone of Germany, in honour of military and civilian personnel who have lost their lives in the Berlin Air Lift

Longer Staff College Courses

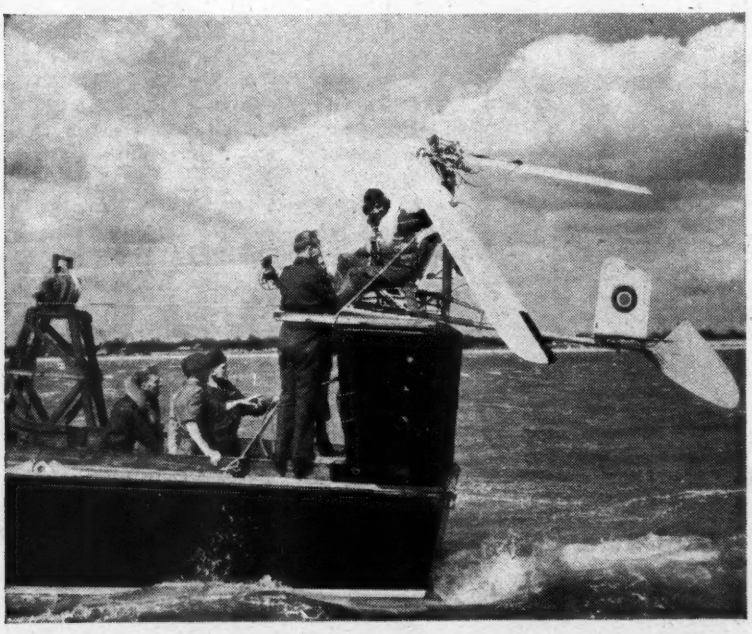
AT present of nine month's duration, R.A.F. Staff College courses are to be extended to a year—at Bracknell from next January and at Andover from May.

Battle of Britain Service

A Battle of Britain thanksgiving service is to be held in Westminster Abbey on September 15th. Next-of-kin, Battle of Britain pilots and retired R.A.F. officers should apply for tickets (by September 5th) to the Under-Secretary of State, S.4(d), Air Ministry, Whitehall, London, S.W.1.

Scholarship Winner

THE first Royal Aeronautical Society Charter Scholarship for the year 1949-50 has been awarded to Mr. J. A. Dunsby, a student of the society. He will carry out research work at the Imperial College of Science and Technology.



IF KITE NO FLY . . . A demonstration of the Focke-Achgelis Fa. 330 rotor kite, as flown for observation from U-boats, was to have been given last week at Calshot, but a gusty wind removed a rotor blade and the attempt had to be abandoned. S/L. F. J. Cable, helicopter test pilot at the Airborne Forces Experimental Establishment, is seen in the pilot's seat just after the mishap.

FORTY YEARS BACK

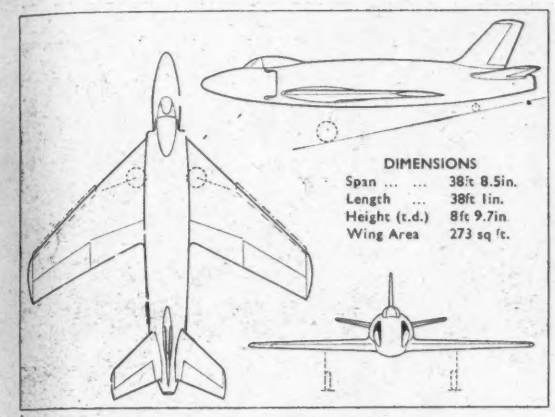
"A series of provisional regulations, constituting a 'rule of the road' for aeronauts, has been drawn up by the Commission Aerienne Mixte . . . When flying at night all machines must have a red light on the left and a green light on the right which can be seen both from the front and the side . . . white lights must be placed at the farthest point forward and the lowest part of the machine."—*From "Flight" of August 7th, 1909.*

Atlantic Rush-hour

THE United States Military Air Transport Service is flying 567 United States airmen across the Atlantic in four flights. Globemasters carrying 95 passengers and crew are flying to Sculthorpe through Bermuda and the Azores. The number of passengers on each aircraft is almost certainly a record, since the previous largest Transatlantic passenger load is believed to have been 87.

Flying Clubs' Convention

THE Association of British Aero Clubs and Centres is to hold, on Saturday, September 3rd, what is hoped will be the first of a series of annual summer conventions. The venue is White Waltham Airfield, Maidenhead. As the event is intended mainly to be an opportunity for social meeting and discussion of current affairs between club members,



PLANNED FOR SPEED: The exact form of the horizontal and vertical raked surfaces, and the extent of the leading-edge slots, are apparent in this general arrangement drawing of the Supermarine 510 experimental transonic fighter. (Rolls-Royce Nene). Students of aerodynamics and aeromodellers will, we believe, be especially interested.

there will be no flying display, but there will be a sealed-time (between 2 p.m. and 3 p.m.) arrival competition with a 20 gn Philco radio as prize; 160 other prizes, it is stated, will be distributed in connection with the convention; they include a complete aircraft—a new Auster. Full details are obtainable from the A.B.A.C. at Londonderry House, Park Lane, London, W.1.

Cadet Exchange

A PARTY of 50 American and Canadian air cadets is now in this country and enjoying a comprehensive programme of visits and tours divided between R.A.F. stations (with other centres of aeronautical activity) and those places of historical and general importance which interest overseas visitors. They arrived on Friday in a U.S.A.F. Constellation, which returned to America on Sunday with a party of 35 A.T.C. cadets who are making a complementary tour of American air stations and other places of interest. Other American cadets are spending a fortnight in France and Switzerland. The visits are the first of a series of exchange tours between air cadets of the Old and New Worlds.

Espadon Mods.

THE fourth prototype of the massive but shapely S.O.6020 Espadon single-Nene fighter, displayed in this year's Paris Salon, will have a lighter structure and "divers aerodynamic ameliorations."

Bombs and Birds

MR. HENDERSON, Secretary of State for Air, recently indicated in the House of Commons that he was reconsidering the proposal to establish a bombing range at Frampton Sands. The site is near the Severn Wildfowl Trust's sanctuary, and strong protests against the proposal had been made for that reason.

Boys' Flying Camp

JUNIOR members of the Air League, aged 12 to 14, are now under canvas at a flying camp arranged by the Air League at Hamble. Two parties will each spend two weeks on the airfield. A similar camp was run last year at Shoreham in association with the annual camp of a University Air Squadron; this year's event is associated with the annual training of reservists at the A.S.T. Reserve School. The object is to give the boys personal knowledge of service flying at an early age; last year each boy had at least one hour's flying.

Comet Congratulations

THE following message was sent on July 27th to the de Havilland Aircraft Company from "the chairman, deputy chairman and all at B.O.A.C.": "Warmest congratulations on magnificent showing of Comet on initial flight. Rely on us to continue closest collaboration so that your epoch-making airliner shall be operated with optimum effect on air routes of the world by British crews and to the resounding benefit of British Civil Aviation."

Models Great and Small

A MODEL-AIRCRAFT engine, of 0.2 c.c. capacity and weighing only 1 oz. will be among the exhibits at *The Model Engineer* Exhibition, to be opened at the New Horticultural Hall, London, S.W.1, next Wednesday (August 17th) by Sir Frederick Handley Page. By contrast, the largest model in the show will be a 17ft replica, loaned by the Admiralty, of H.M. aircraft carrier *Indomitable*. Aircraft scale models will include one of the Saunders-Roe SR/45.

News in Brief

THE R.A.F. Benevolent Fund has been allocated £3,825 from the profits of the 1948 Royal Tournament.

* * *

As from August 1st S. Wolf and Co., Ltd., have changed their name to Wolf Electric Tools, Ltd.

* * *

Anglo-American Oil Co., Ltd., announces the immediate return of its branded aviation spirit, to be sold under the name of Esso Aviation Gasoline.

* * *

The two Auster V aircraft which will be shipped in the vessel *John Biscoe* for the Falkland Islands Dependencies Survey are to be equipped with Edo floats.

* * *

Rigid extrusions, in rod and tubular form, are now being marked by De La Rue Extrusions, Ltd., 84, Regent Street, London, W.1, in phenolic thermosetting plastic materials.

* * *

The Universal Brush Co., Ltd., of Luton, Beds, announce that they have been appointed the sole selling agents for Nash Brushes, Ltd., of Watford, who are manufacturers of industrial brushware, with special application to the aircraft industry.

(Left) DECORATION FOR THE MESS: The bronze trophy, given by W/C. G. Cooper, M.P., which was the prize in the R.Aux.A.F. inter-squadron race at the Elmdon meeting. It was won for No. 502 (Ulster) Squadron by F/O. W. Bowden (Spitfire 22) at 325 m.p.h. (R.A.F. official photograph.)

(Below) ANOTHER ELMDON VICTOR: Flown by P. G. Lawrence, this Blackburn Firebrand 5a won the Air League Challenge Cup Race at a speed of 302 m.p.h.

AERO 45 in the Air

Light All-metal Twin from Czechoslovakia (*Illustrated by "Flight" Photographs*)

By Wing Cdr. MAURICE A. SMITH, D.F.C.

FOR many months past I have had my eye on the Aero 45 because it seems to possess almost all the qualities that I would ask for in a somewhat luxurious personal aircraft. Confirmation of its good flying qualities and high performance was needed before any recommendation could be given, and this was forthcoming when, last week, I was able to fly it for more than an hour from Blackbushe.

Not for the first time was the Aero 45 described as "the Czech Gemini," when, at the National Air Races, it won the Norton Griffiths Trophy Race at an average speed of 163 m.p.h. It is, in fact, similar in many ways to the Gemini, but as a Gemini operator I have to admit that it has certain advantages. In particular, it is of stronger all-metal construction, has a better payload, and flies well on one engine. It does not, however, offer the comfort or roominess of the Gemini, and does not have its exceptional slow-flying qualities.

The construction of the Aero 45 is quite straightforward; the fuselage is a three-section metal monocoque with four-seat cabin arrangement and with a Continental-style single-curve windscreen and nose. The wings are of two-spar construction made in three units—centre and two outer sections. The whole is flush-riveted and has a commendable surface-finish. Control surfaces are fabric-covered—a single fin and rudder are fitted—and trimming tabs are provided for elevators and rudder.

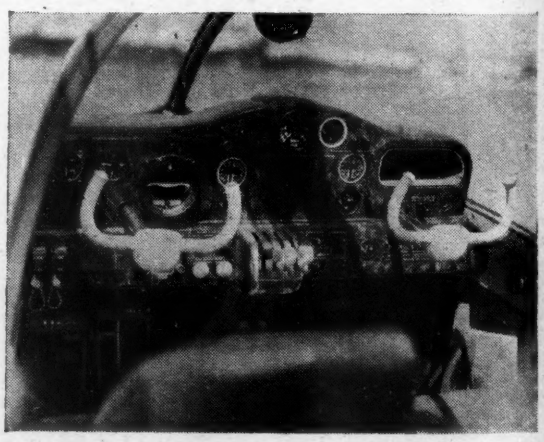
The undercarriage is, of course, retractable and, like the other services, is electrically operated. A 24-volt system is employed, and a single 300-watt generator on the port engine is standard equipment. Access to the battery, control systems, instruments and radio is obtained by lowering the whole hinged nose portion of the fuselage, complete with landing light.

Since the prototype appeared, there have been several changes, notably in the tail; the tail plane is now considerably higher.

Popular on the Continent, the Walter Minor 4-III engine (two of which power the Aero 45) is not unknown in this country. It gives 105 b.h.p. at 2,500 r.p.m., or for cruising 80 b.h.p. at 2,300 r.p.m. A metal airscrew with blades adjustable on the ground is normally fitted, but both hand-operated and electrically operated v.p. airscrews are available as extras, the latter being fully feathering. Incidentally, a version of the Walter Minor, known as the 4-IIIS, has been developed to operate with an auxiliary centrifugal supercharger—disengaged or engaged at will—that results in an increased power output of 120 b.h.p. at 2,600 r.p.m. for three minutes on take-off.

Two main and two auxiliary fuel tanks are usually fitted in the Aero 45 wings, although the outers may be omitted. Each one holds respectively 19 and 15 gallons. The total capacity of 68 gallons gives 6 hr 40 min cruising endurance at 140-150 m.p.h.

One enters the cabin of the Aero 45 through the single



Instruments and controls are grouped in a logical manner in the cockpit, and colours are used to classify the various levers.

up-hingeing door in the port side. The enclosure seems sturdy, and half may be jettisoned in emergency by pulling out a pin in the roof. The seats are comfortable, but offer only the bare space necessary, and in front one finds shoulder and cheek rather too near the sloping sides of the enclosure. A large luggage locker is behind the rear seats.

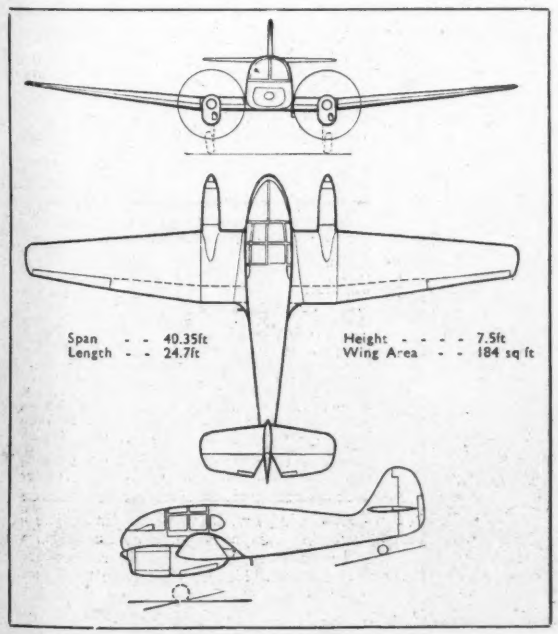
The view in all forward and sideways directions is very good indeed, and the closely cowled Walter Minors appear slimmer and sit more forward than do the Cirrus Minors of a Gemini. The wings, too, appear (and, of course, are) slimmer and more tapered when viewed from the pilot's seat. Spans and areas for comparison are: Aero 45—40.35ft and 184 sq ft; Gemini—36ft 2in and 191 sq ft.

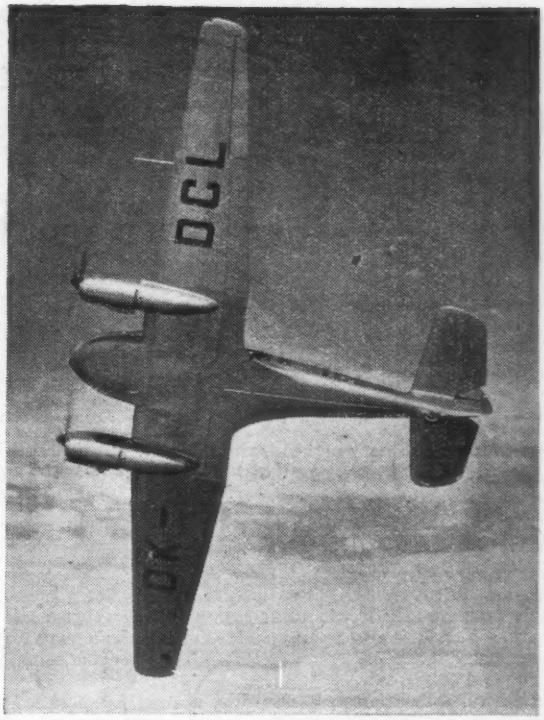
A generous complement of knobs, buttons and dials is neatly arranged in the cockpit. Hand and priming pumps permit starting from cold while one is seated in the cockpit. Centrally on the floor with the wobble pumps and three-position fuel tank selector levers are the elevator and rudder trimmers and cabin and carburettor hot-air selectors. Parallel-swinging rudder pedals are provided, and the wheels are of the push-pull horn type. The in-and-out travel is considerable.

A colour code is used as in most Continental aircraft—all fuel controls yellow, emergencies red, etc.—and the instruments carry colour bands indicating minimum, normal and maximum readings. For some unaccountable reason we in this country seem generally to have scorned such systems.

Flight instruments, the three-position ignition levers, and the undercarriage switch and lights, are placed in front of the first pilot on the port side, and brakes are provided only for him. The throttles (and radio, if fitted) are central, as are the red emergency undercarriage-operating knobs. Engine instruments are grouped around the radio, and electricalities are on the starboard side.

After starting-up I confirmed what I had observed at Elmdon, namely, that the Walter Minors are content to idle remarkably slowly. There was little opportunity to taxi as the aircraft was 30 yards from the end of the operative runway facing into a wind blowing more than half a gale. The small amount of ground manœuvring required before take-off and after the landings was sufficient to indicate responsiveness, good control and good view around. The take-off check was brief and chiefly comprised the centralizing of the trim lever, setting of flaps and tightening of the throttle friction nut.



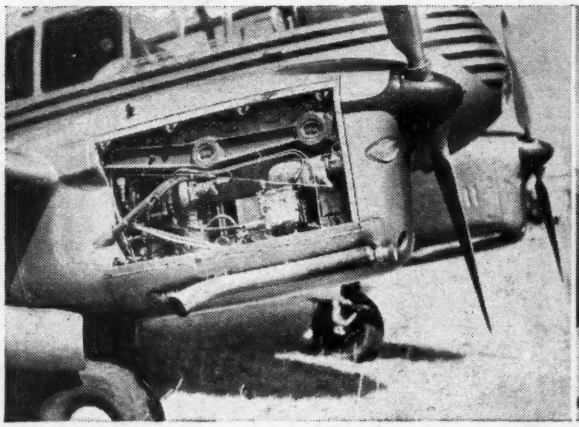


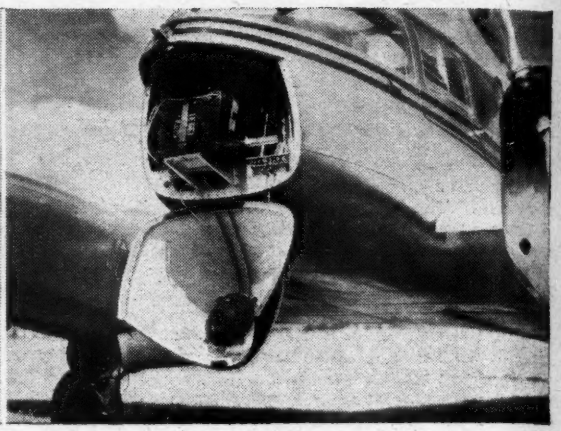
The Aero 45 is very manœuvrable and, solo, is fully aerobatic.

On take-off into the unusually strong wind (flaps at 15 deg) there was no swing tendency provided a small lead was given to the starboard throttle, and with two up, full tanks and luggage the Aero 45 came off in less than 100 yds and was prepared to climb at once. Best climbing speed is 125 km/hr (77.6 m.p.h.) and the rate (with fixed-pitch airscrew adjusted for racing) approached 1,000 ft/min. The wheels take about 15 sec to fold up and lock (as indicated by the usual green lights) and when the operation is complete the flaps are switched up. Very little change of trim occurs in either case. Leading-edge slats between the engines and fuselage are interconnected with the undercarriage and close as the wheels go up (or vice versa).

First, after feeling the controls, I set about trying out the remarkable stability of the Aero 45. Trimmed at a cruising speed of 220 k.p.h. (137 m.p.h.) and 2,250 r.p.m., I made quite accurate turns and changes from side to side first with wheel alone then with rudder alone. This was followed by pulling the nose up until the speed had dropped by about 75 km/hr (46 m.p.h.) and then releasing the controls. To use very untechnical terms, three diminishing "switchbacks" were sufficient for the aircraft to get itself back on to an even keel again. For normal flying the controls are all light and responsive and are pleasantly harmonized. Little use need be made of the rudder and, once the aircraft is trimmed, cross-country flying can be carried on with feet off. If there is a weakness I would say it is in the weight and length of movement of the push-pull elevator-control wheel at the two ends of the speed range.

Next to be tried out was the single-engined performance. When cruising as above, a quick cut of either engine, using the ignition switches, could be controlled at once, and the aircraft could be held straight on ailerons alone if need be. Three-quarters of a turn of the rudder trimmer made hands-off flying quite simply, and turns could be made on ailerons alone, either away or towards the good engine. The best single-engine speed is in the region of 140 km/hr (87 m.p.h.), and at the weight at which we were flying the aircraft handled well and maintained height easily at about 80





(Left) One of the neatly and closely cowled 105 h.p. Walter Minor 4-III engines of the Aero 45; note the solid mounting and flexible bearers. (Right) Nose door opened to give access to battery, controls and instruments.

Aero 45 in the Air . . .

m.p.h. With the fixed-pitch metal airscrews fitted I was able to climb a little when flying at 2,000ft, and with full normal load it is said to be possible to climb to 4,900ft on one engine if v.p. airscrews are fitted. Two-engine ceiling is quoted at 18,700ft.

Having satisfied myself regarding normal handling and single-engined performance, I tried stalls with and without engine and flaps. The speeds vary, of course, and by A.S.I. are approximately:—

	km/hr
Engine on with flaps and wheels down	80
Engine on with flaps and wheels up	90
Gliding with flaps up	100

Some aileron control remains up to and after the stall, and the sink is usually straight and gentle. More warning would be an advantage. The wing loading at 3,085 lb weight is 16.7 lb/sq ft as compared with the Gemini's 15.7 lb/sq ft at 3,000 lb a.u.w.

Spinning presents little difficulty, starting shallow and steepening rapidly so that after the third turn the aircraft dives out of the spin unaided, at high speed. A strong backward pull is needed to raise the nose at high speed (over 185 m.p.h.). Mr. Anderle, the makers' chief test pilot, told me that while on test he had dived the Aero 45 to 380 km/hr (238 m.p.h.) and also made a 6g pull out without any signs of damage to the aircraft structure.

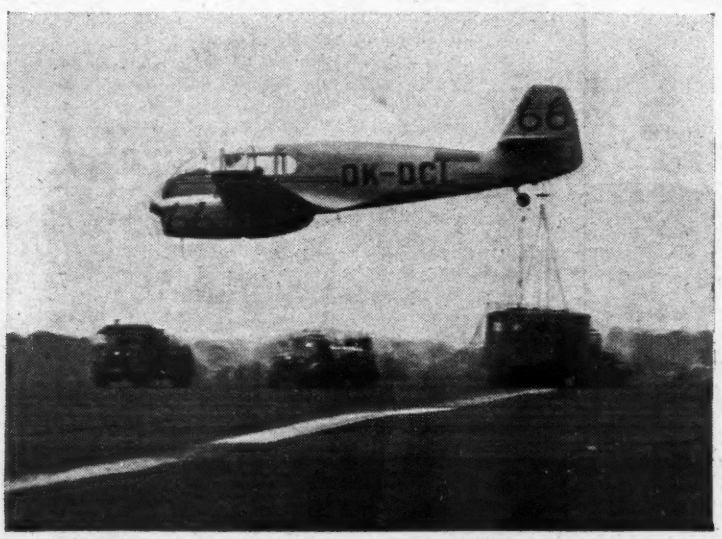
After hearing this reassuring news as to the strength, I tried some aerobatics and found that a nice wide loop from 280-300 km/hr (174-186 m.p.h.) was as pleasant and simply executed a manœuvre as one could wish. It requires a good, big pull to go round, but as soon as the throttles were opened two hands were available for the wheel and there was no trouble at all in easing the machine up and over. It is advisable to throttle well back in the ensuing dive or speed increases very rapidly and some time and effort are wasted on the pull out.

Barrel (or rather "barrelly" slow) rolls are another manœuvre which the Aero 45 does very nicely—a comfortable speed being much the same as for loops. Perhaps it should be added that although the strength seems to be there the machine is licensed only for solo aerobatics. This may be due to the single emergency exit on the port side.

And so, having tried most of the usual manœuvres and a few extra, I glided down and prepared to land. There is no limiting speed for lowering of wheels, but flaps have a 150 km/hr (93 m.p.h.) maximum-speed limitation. The wheels can be seen when locked down and when flaps are lowered as well the need to trim is felt quite strongly.

Initial approach speed is around 150 km/hr (93 m.p.h.) and the angle of approach is such as to give an excellent view of the runway. There was a certain amount of distortion when watching the ground "approach" through the large, curved plastic wind-shield. The round-out requires

(concluded at foot of p. 160.)



DATA FOR THE 4/5 SEATER AERO 45
Two 105 h.p. Walter Minor 4—III Engines.

Span	40.35ft
Length	24.7ft
Height	7.54ft
Wing area	184 sq ft
Weight empty (full equipt.)	1,896 lb
Useful load	1,410 lb
Max. A.U.W.	3,306 lb
Wing loading	18 lb/sq ft
Max. speed	174 m.p.h.
Cruising speed	145 m.p.h.
Stalling speed (full flap)	50 m.p.h.
Climb to 1,000 m (3,280ft)	3.8 min
Initial rate of climb	980ft/min
Ceiling, 2 engines	18,700ft
Ceiling, 1 engine	4,900ft
Range (four tanks, 68 gal)	930 miles
Fuel consumption (2,250 r.p.m.)	11 gal/hr

PROOF OF PERFORMANCE: Jan Anderle crossing the finishing-line at Elmdon in the machine which forms the subject of this article. He won the Norton Griffiths Challenge Trophy at an average speed of 163 m.p.h.

Replacing the Rapide

A Critical Examination of Requirements for Particular British Internal Routes: The Ideal Specification

BEFORE the war the D.H.89, or Rapide, was widely recognized and adopted as an economical aircraft for passenger operations, and even now, fifteen years after it was designed, it is being flown successfully by several charter companies on regular services in the United Kingdom. Such a record is probably unique. Changed conditions in the post-war period—particularly high labour costs—and the development of larger aircraft have, however, reduced the earning capacity of the Rapide to an uneconomic level. It has long been apparent that a replacement was necessary if B.E.A. were to continue services to the more remote airfields of the British Isles.

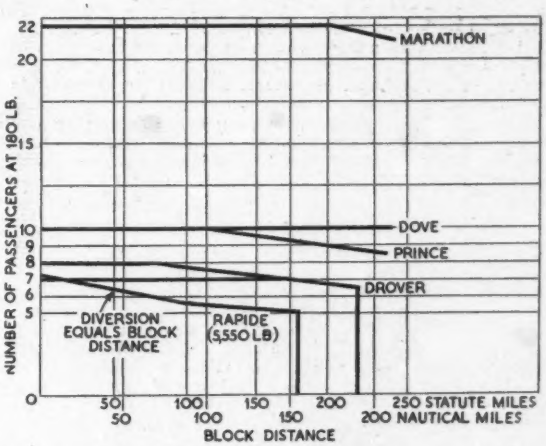
During the year 1949-50 B.E.A. will have 19 Rapides in service, flying over 1,135 route-miles, chiefly in Scotland. During the year they will fly some 1,395,000 aircraft miles in just over 15,000 flying hours, at an average block speed of 92 m.p.h. The total capacity of these aircraft will be 897,000-tonne-kilometres, which is some 2.3 per cent of the total B.E.A. operations. According to B.E.A. calculations, the Rapide operations account for 15 per cent of the Corporation's total losses and a load factor of 206 per cent would be necessary to break even.

The factors which account for such uneconomic operation are considered to be the small size, low speed and high maintenance costs. The average capacity payload offered by a B.E.A. Rapide amounts to 880 lb or five passengers, so that with an average load factor of 65 per cent the total contribution to operating costs, including a crew of two, is the revenue from three passengers. Incidentally, during the next 12 months B.E.A. Rapides will be converted for one-crew operation by the introduction of full V.H.F. radio cover within the British Isles. This modification is expected to reduce the deficit attributable to Rapides to about 11 per cent. For the year 1950-51 B.E.A. plan to further reduce the Rapide losses by detail improvements in operational methods.

Although the cruising speed is normally 115 m.p.h., the average block speed over short distances is 92 m.p.h. As a result, comparatively few revenue miles are covered in a given number of flying hours.

Servicing costs are high because the fabric-covered wooden-braced biplane airframe of the Rapide is expensive to maintain. At an average of £3.27 per flying hour the maintenance costs work out, per ton of gross weight, at 40 per cent more than those of the Viking. Engine maintenance costs are reasonable. It follows, then, that the ideal Rapide replacement for B.E.A. should combine an economic size and payload with a higher cruising speed and low maintenance costs. At the same time, in order to serve the same remote areas it should be capable of a short take-off and landing.

Four major factors in deciding the most suitable aircraft are performance, layout, size and power units. The aircraft should be as large as possible consistent with a reasonable load factor and frequency of service. An analysis of traffic potentials by route and stages estimated for 1952 (the probable first year of operation) and 1955 (a mid-way year in the anticipated life of the replacement) established a 10/15-passenger aircraft, with allowance for mail and freight, as the best compromise. It has been further established that B.E.A. would require 15 aircraft of that size to meet estimated traffic demands. Volumetric capacity was also considered since it must be adequate to stow that load which could be lifted over the shortest stage (150 nautical miles in still air) without reserves or allowances. For the longest range requirements (700 nautical miles in still air without reserves) a payload reduced below the maximum seating capacity would be acceptable. The layout should be suitable for the type of traffic and maintenance facilities available and to give the lowest operating costs for size. Performance of the aircraft should naturally be suitable for the airfields and routes over which it would operate.

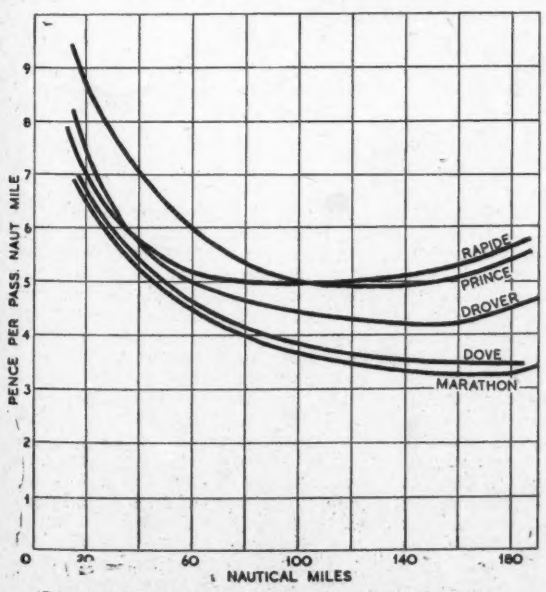


Payload/range characteristics of the Rapide and four British alternatives.

An analysis of airfields and their dimensions shows that the critical take-off requirement to reach a height of 50ft on all engines is 600 yd on grass and that the landing distance from 50ft should not exceed 420 yd. Great importance would be attached to the power units selected particularly with regard to reliability, weight and cost.

During the past year B.E.A. are understood to have delayed action to secure such a replacement in the hope that a satisfactory and economic aircraft might be obtained from among several prototypes and one production machine now flying.

Four British types were considered, the Handley Page Marathon, Percival Prince and the two de Havilland types, the Dove and Drover, and an analysis of the characteristics of each was made. Except for the Marathon (two crew) each one was studied with single-crew operation, a fuel reserve of three-quarters of an hour stand-off, plus 100 nautical miles diversion. On this basis, and assuming the direct operating costs of the Rapide per passenger mile, at 80 miles stage length, to be 100 per cent, the direct operating costs of the four types



Estimated direct costs for Rapide and possible replacements.

Replacing the Rapide . . . . .

have been calculated at the following values:—

	Per cent
Prince (ten-seater)	108
Drover (seven-eight-seater)	94
Dove (ten-seater)	84
Marathon (20-22-seater)	80

According to the analysis, the Dove shows a potential 16 per cent reduction on the Rapide in direct cost per seat-mile, but was not designed to meet such take-off requirements. The Marathon, with the lowest direct operating cost, is considered too large for B.E.A.'s operation into small airfields. Of all four types the Drover most nearly approaches the airfield performance requirements with its 785 yd for take off. Hence the conclusion is reached that since the aforementioned requirements are not completely met and, moreover, that none of the existing aircraft happens to provide for the ideal payload, whatever its other merits, none will form an ideal Rapide replacement for B.E.A.

Helicopters have also been considered, and although they will probably fly on such commercial operations within the operational life of a fixed-wing replacement for the Rapide it is thought probable that the rotating-wing type will be used first to open up new services in areas with a high traffic potential, and that it will not be a satisfactory solution on the majority of present Rapide routes within the next ten years—on the grounds of safety in bad weather and also of economy.

It will be seen from the foregoing that the Rapide has fulfilled a function so unique that in the changed conditions of the present, and of those estimated for the future, it will be difficult to replace, and that no aircraft designed for normal civil operations will suffice. In other words, B.E.A. feel that a machine must be designed for the purpose. This purpose may be summed up as the operation of scheduled airline services, chiefly in Scotland, at the lowest possible cost consistent with regularity and flying from grass airfields.

Take-off and landing requirements have already been mentioned but the choice of number and type of engines will be a major factor in determining the replacement's characteristics and its success. The number of engines depends upon the relative economics of alternative layouts and the power plants available. It has been calculated that for a 10/15-passenger aircraft a four-engined arrangement would be 12 per cent cheaper in direct cost per seat-mile than would a three-engined layout of similar performance, and 26 per cent cheaper than a twin-engined layout.

Assuming a four-engined design, therefore, the requirements in size are thought to be most nearly met by the use of four Gipsy Queen III engines as used in the Rapide, by four Blackburn Bombadiers or by four Gipsy Major 10s. B.E.A.'s preference is understood to be for one of the Gipsy engines, but it is belived that the Corporation would consider alternatives.

Whatever the engine, the requirement remains for accommodating the maximum passenger load which can be lifted for a still-air distance of 150 nautical miles subject to the ability to take-off and land in the prescribed distance and to the provision of prescribed space per passenger. Tankage should be provided for a still air range of 700 nautical miles without reserves or allowances.

A new aircraft designed according to the proposals mentioned, and operated with strict regard for economy, will, it is thought, give promise of operating costs amounting to some 70 per cent of those of the Rapide, on the average 80-mile stage flying over the same routes. If these calculations prove to be correct, it is believed that, combined with other reductions in cost, B.E.A. might convert certain services, now operating at a loss, into commercial propositions, and also make possible the opening up, economically, of a number of new internal routes.

It is understood that tenders for the design and construction of an aircraft on these lines are invited. Provided that a satisfactory design tender is submitted, the Corporation has made it known that a preliminary order for 15 aircraft straight off the drawing board will be given.

W.R.A.F. COMMISSIONS

UNDER a new commissioning scheme for the Women's Royal Air Force, women with a university degree or equivalent professional qualifications may be commissioned in the technical branch, while those who have passed the intermediate examinations of a recognized university or possess equivalent qualifications may enter the equipment and secretarial branches. There will also be vacancies in the catering branch under this scheme. A second scheme, applying only to the equipment and secretarial branches, provides for the award of commissions on completion of professional and officer training.

TWO-WAY RADIO AT ELMDON

A SUCCESSFUL two-way V.H.F. radio-telephone demonstration was held at the National Air Races. The communications control officer at Elmdon Airport operated a unit which was in communication with cars equipped with Pye two-way radio, posted at the Corley, Knowle and Coleshill turns, and manned by members of the Royal Observer Corps; the airport unit was in turn connected by landline with the public-address system, the B.B.C. commentator, and with the ambulance, fire and first-aid centres.

The object of the demonstration, which constituted a searching test owing to the bad weather and low visibility, was to prove the efficiency of two-way radio in keeping the whole of such a 20-mile course under continuous observation.

The new Pye V.H.F. unit, measuring 11½in × 9¾in × 5¼in, was used; it will, it is stated, give clear speech both ways over a radius of 15 to 20 miles.

NON-STARTERS—BY ORDER

IN our July 21st issue some details were given of the methods by which pilots had been chosen to represent the various R.Aux.A.F. groups in their special race at Elmdon. In this connection the Adjutant of No. 615 (County of Surrey) Squadron points out that no Biggin Hill Spitfires were eliminated from the 61 (Eastern Reserve) Group by being beaten by S/L. Kennard (Meteor 3) of No. 500 Sqn., for the reason that they did not, eventually, take part in the eliminating contest; it was decided by Command H.Q. that a jet should represent the group, so the two Spitfires were withdrawn. The original information, incidentally, was as supplied by the Air Ministry.

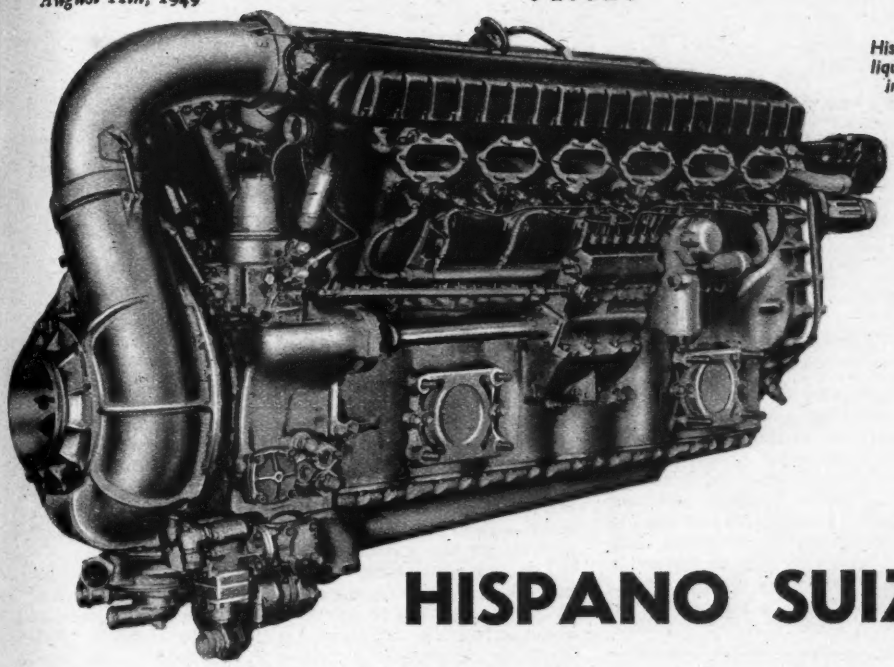
Aero 45 in the Air

(*Continued from p.* 158)

a larger and longer pull than would be expected. It would not be fair to judge the landing on the experiences on one very windy day, but even so I would say that the landing is one of the least pleasant parts of flying the Aero 45. I was told later that it is arranged to be comfortable when the full load of passengers are on board. This may be so, but the final right backward and slight upward movement of the wheel to get the tail down is not very convenient.

To sum up, I would say that in general the performance and handling of the Aero 45 are as attractive as I had hoped and expected, and the machine comes very near to meeting the specification more than once advocated by *Flight* for an all-metal light twin of this class. Its strength, metal construction, fair-sized tyres and wheels, range, good cruising speed, and, in particular, single-engine performance, will undoubtedly appeal in such countries as Africa and India.

The Aero 45 is made by Kovo, Ltd., of Prague, who are represented in this country by Britavia, Ltd., 1, Great Cumberland Place, London, W.1. Britavia will be the distributors of the Aero 45 and other Czech aircraft. It is thought that sales of the Aero 45 will be possible in this country in the near future, although they are likely to be very limited, and will depend upon the trade agreement which is at present being negotiated. Should permission be given for the importation of Czech aircraft, delivery will probably be effected in under four weeks. A provisional price of £4,250 has been suggested, and to this must be added the 20 per cent import duty. Whether or not the total figure will include the new electric feathering v.p. airscrews is not yet known. The price of the airscrews separately is in the region of £120, and again a 20 per cent import duty must be added. Although the Aero 45 is in many respects similar to the Gemini, this should not have any bearing upon the issue of an import licence or otherwise, for not only is the Gemini, the only comparable design, now out of production but the fact that the Czech aircraft is of all-metal construction immediately places it in a different category for home and overseas use.



Hispano Suiza 12-cylinder, V-type, liquid-cooled engine with petrol injection direct to the cylinders.

HISPANO SUIZA 12B

New Series of Liquid-cooled Engines and a Compounded Unit

DEVELOPED from the well-established 12Z series, the latest Hispano Suiza engines have sturdier construction, higher charging pressure and improved performance. Three versions are scheduled for production: type 12B 00 has a single-stage, single-speed blower, 12B 20 a single-stage, two-speed blower, while 12B 40 has the single-speed blower and is compounded with an exhaust turbo-blower to produce what in France is termed a "groupe moto-propulseur." Cylinder head and coolant jackets for each row of six cylinders is a monobloc casting into which the cylinder sleeves are screwed. Twin camshafts on each cylinder head actuate two inlet and two exhaust valves per cylinder. Pistons of forged light alloy carry a fire ring, two compression rings and an oil scraper ring. The seven-bearing crankshaft is chromed on the journals and pins and an unusual feature is the attachment of the eight counterweights by welding.

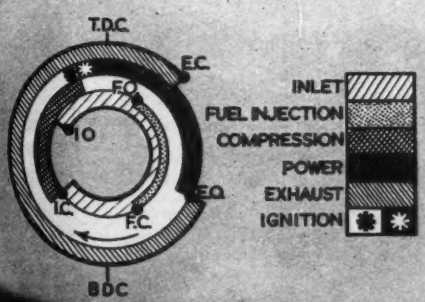
At the forward end a straight-toothed gear reduces the crankshaft speed at a ratio of 2:1 for the airscrew shaft. An alternative ratio of 3.3:1 can be arranged. The driving pinion is mounted independently on two roller bearings and receives its drive from the end of the crankshaft by means of a torsionally-resilient shaft. On the reduction gear casing are mounted the "Eclipse" electric starter, the forward lubricating oil scavenge pump and the two magnetos. One magneto feeds plugs on the inlet sides of the cylinders and the other plugs on the exhaust sides. Ignition timing is automatically regulated by the charging air pressure to ensure combustion conditions and secure good cruising economy.

From the rear of the crankshaft are taken the drives for the overhead camshafts and for the blower. Here also are arranged the duplex oil pump (pressure and rear scavenging units), coolant pump, fuel feed pump and a 100 h.p. take-off for an accessories drive box.

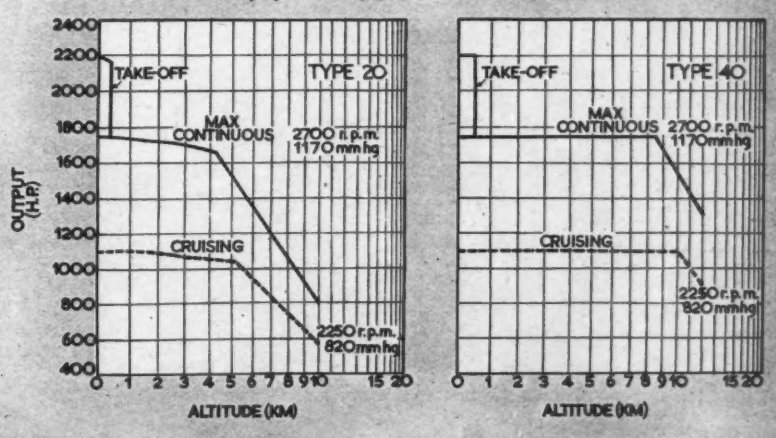
Six-unit Lavalette fuel injection pumps, mounted centrally on the sides of the crankcase outside the cylinder blocks, are also driven from the rear. Fuel injection is controlled by a Hispano Suiza mixture regulator with corrections for the density of air delivered to the cylinder and for temperature. Direct injection to the cylinder permits adequate scavenging of the cylinders, involving substantial valve overlap, without loss of fuel.

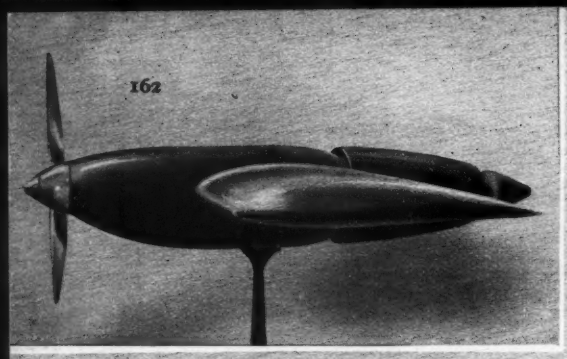
Lubrication is effected with high- and low-pressure

Timing diagram	deg
Inlet opens	60 *before* TDC
Fuel injection commences	30 *after* TDC
Fuel injection terminates	30 *before* BDC
Inlet closes	50 *after* BDC
Ignition	21-18 *before* TDC
Exhaust opens	65 *before* BDC
Exhaust closes	45 *after* TDC

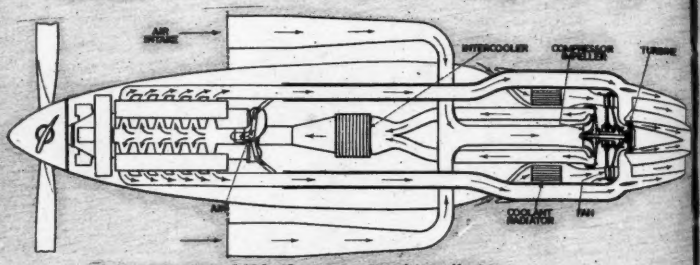


Power curves of piston engine with two-speed blower (left) and of the "groupe moto-propulseur" (right).





Model of 12B 40 in wing nacelle.



Schematic plan of 12B 40 wing-mounted installation.

HISPANO SUIZA 12B . . . . .

systems. To prime the circuit prior to starting an electrically driven pump is operated for a few minutes. At the start, when the oil temperature at the delivery of the engine-driven pressure pump is below 40 C the pressure in the circuit is controlled by a thermostat and is carried to a value higher than normal. When running conditions are established the high-pressure system is held at 140 lb/sq in and the low-pressure system for the overhead camshafts at 28.5 lb/sq in. The valve effecting this reduction of pressure spills to an inclined trough from which oil feeds to the individual cylinder walls. As the temperature of oil at the pump delivery rises, a diaphragm type regulator reduces pressure in the main circuit to 85 lb/sq in but the low-pressure system remains unaffected at 28 lb/sq in.

Bore	150 *mm*
Stroke	170 *mm*
Swept volume	36 *lit*
Compression ratio	6.85
Reduction ratio	2
Blower ratio (12B 00)	5.65
Blower ratio (12B 20)	6.82 *and* 8.91
Length (12B 00)	2,250 *mm*
Length (12B 20)	2,390 *mm*
Width	820 *mm*
Height	1,087 *mm*
Weight (12B 00)	910 *kg*
Weight (12B 20)	930 *kg*

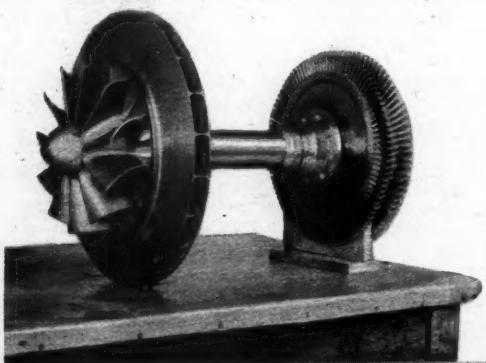
Filtration of lubricating oil has received special attention. On the delivery side of the pressure pump is an Autoklean filter holding any matter over 10 microns. This component is automatically cleared by means of a gear drive from the engine. Before each of the fuel injection pumps and the mixture regulator are further filters excluding matter down to 5 microns. The two scavenge pumps discharge past a magnetic filter to prevent metallic particles being carried into the external circuit. Scavenge oil is passed through another filter, of a size too large for incorporation in the engine, before reaching the oil cooler and thence the service tank for recirculation.

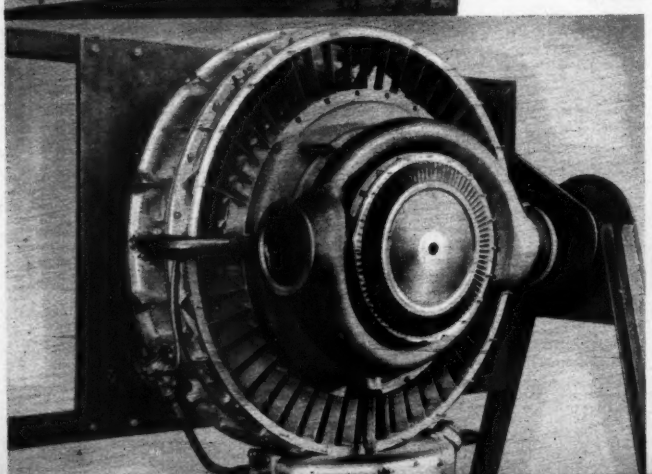
The two-speed unit, 12B 20, develops 2,200 h.p. for take-off, has a maximum continuous output of 1,700 h.p. at 2,700 r.p.m. up to 13,000ft altitude and will cruise at about 1,100 h.p. at 2,250 r.p.m. up to 16,000ft. Performance at altitude is markedly improved on the compounded unit, 12B 40. Output is not raised but maximum power is maintained up to a height of 27,800ft and cruising power up to 32,700ft.

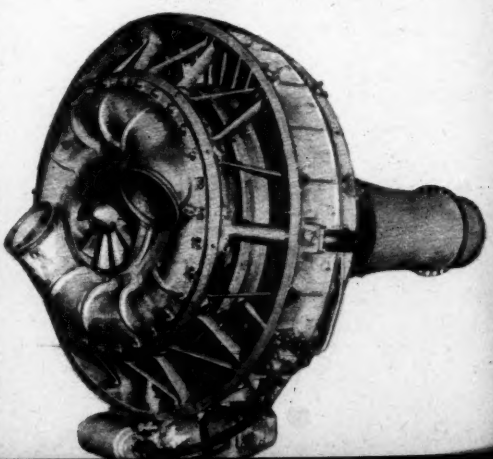
Turbo-Compressor Unit

A wind-tunnel model of a wing installation of this interesting development, exhibited at the recent Paris Salon, had the efflux duct controlled by an axially movable "bullet" but, as shown in the schematic layout, this has now been discarded for deflector valves to regulate the delivery of exhaust gas to the turbine.

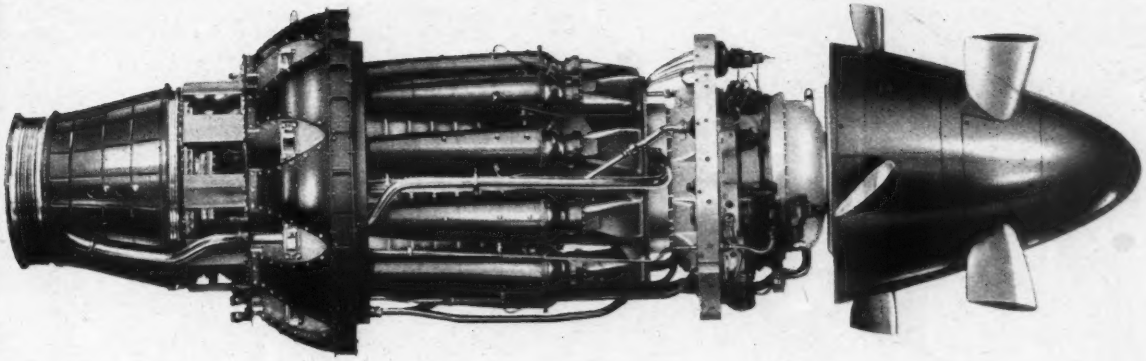
The H.S.600 turbo-compressor unit, housed in the rear of a slim nacelle, comprises a two-stage, axial turbine driving a relatively large diameter axial fan and a centrifugal blower. Air admitted through wing leading edge orifices is ducted to the eye of the blower and thence passed forward through an intercooler to the blower on the rear of the engine. Two ducts, each collecting the exhaust gas from a bank of six cylinders, lead to the rear, where the stream is divided between the turbine and the outer annulus of a propulsion nozzle. The fan draws air from a circumferential duct in the nacelle through the engine coolant radiator and delivers the heated air through the inner annulus of the nozzle. Turbine efflux is discharged by way of a central jet pipe. A variable quantity of air tapped off from the engine-driven blower is used to dilute and lower the temperature of the exhaust gas before it reaches the turbine. F. C. S.







Front and rear views of the H.S.600 turbo-blower-fan assembly. Two-stage turbine wheel and shrouded compressor impeller of H.S.600 unit.



PYTHON

Design Details of the Larger Armstrong Siddeley Turboprop

IN the *Jungle Book*, Rudyard Kipling saved Mowgli from the Grey Apes by the speed and enormous power of Kaa, the python. The power of the Python created by Armstrong Siddeleys is such that it, too, is one of the most powerful of its kind in the world. Kaa was old, and although we cannot carry the analogy very far in this direction, it is perhaps pertinent to observe that the Coventry constrictor is by no means new. That details of the Python turboprop have been withheld for so long must be attributed to the mysterious laws of "security."

During the latter half of 1942, the A.S.X. turbojet with axial compressor was developed by Armstrong Siddeley Motors, Ltd., and shortly after, in common with the general trend of investigations at that period, studies were made of ducted-fan versions of the engine. As a result of these, the gas-turbine design department at the Parkside works came to the conclusion that as good, if not better, performance could be obtained by modifying the A.S.X. somewhat, adding a reduction gear and fitting an airscrew. Design studies were made and the proposal put up to the Ministry, as a result of which a development contract was given to the company. Such is the Python's lineage.

Since its birth, during the summer of 1943, the engine has undergone no major change in its development life, although many detail modifications and refinements have naturally been made, but it was not until April, this year, that information was issued that the Python was to provide the urge for the Westland T.F.2 Wyvern torpedo-strike fighter. With 3,670 s.h.p. available for take-off, and a sea-level maximum *continuous cruise* output of 4,000 h.p. at 465 m.p.h., the Python/Wyvern combination should prove a formidable naval weapon.

The essential physical form of the Python is clearly shown in the main drawing, it being immediately apparent that a reverse-flow compressor/combustion system is employed. Although this design was established for the A.S.X. in the days when knowledge of the essential requirements of combustion systems was somewhat scanty, and it was thought that a considerable length of trunk was required between the combustion chamber proper and the turbine, the fact remains that, even if the most modern straight-flow system were used for the Python, the overall length of the engine would necessarily be increased by some quite considerable (and unwarranted) amount. As it is, the reverse-flow system makes the Python a relatively compact engine, considering that the compressor is of 14 stages, and in front of it is accommodated a compound reduction and contra-rotation gear for the airscrew.

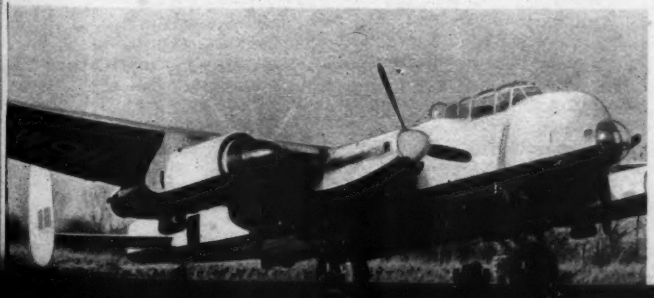
From the centre-line of the rear bank of airscrew blades to the air inlet casing annulus is a fraction over 6ft 4in, this distance—in the flight test engines installed in the outboard nacelles of a Lancaster flying test bed—being closely cowled so as to bring the initial intake aperture close up behind the airscrew. It has, however, been established that no intake disadvantages attend the cropping of this outer cowl back to a point 4ft 9in rearward of its original position. On the contrary, some increase may be realized in ram effect from the airscrew, quite aside from the perhaps no less important advantages accruing from reducing cowling weight and rendering accessibility considerably easier.

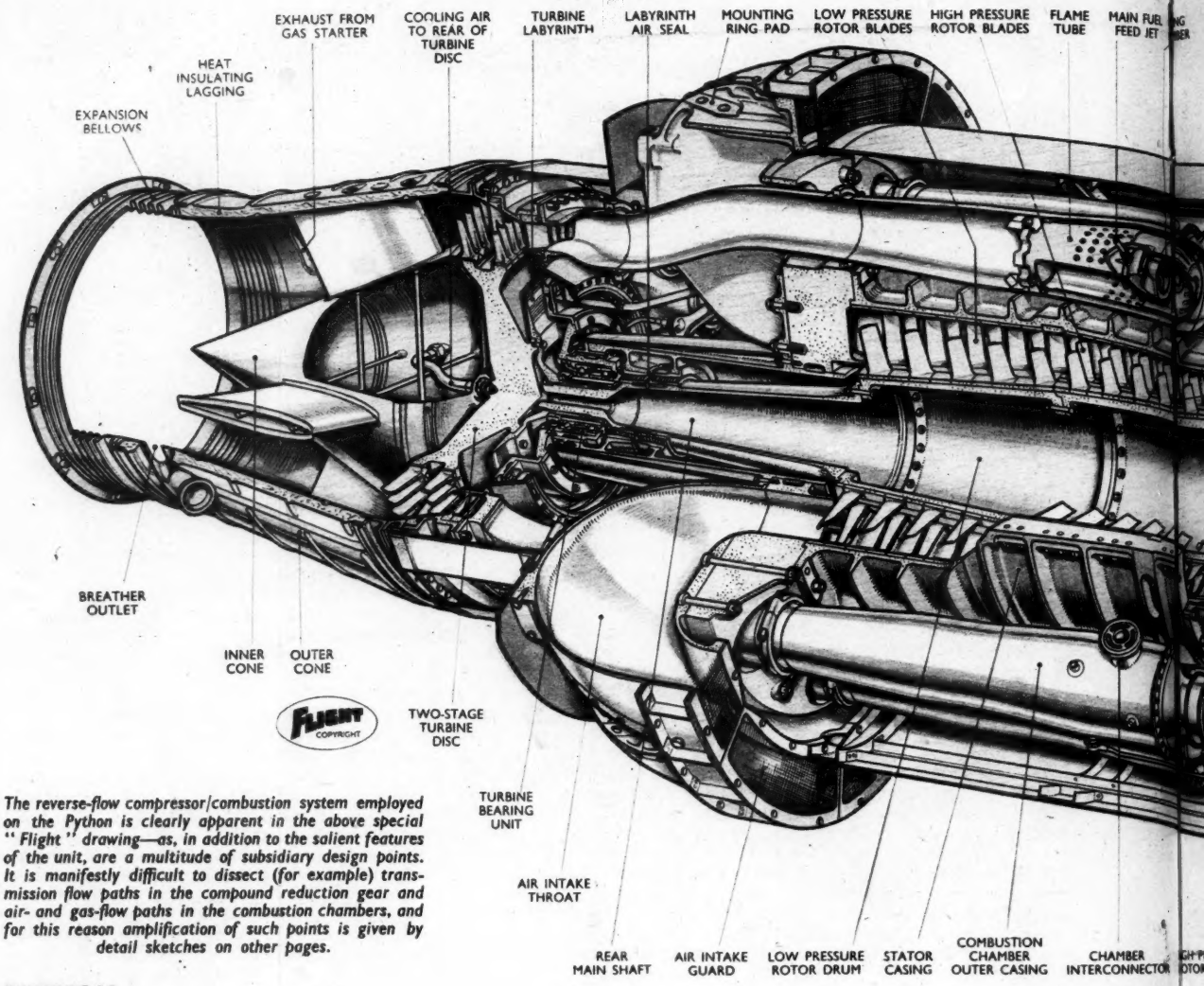
The air inlet casing is a semi-torus divided radially into eleven convergent throats through which the entrained air is swept inward through 180 deg to the entry annulus of the compressor. The first five (low-pressure) stages each have 36 blades, whilst the remaining nine (high-pressure) stages employ 70 blades each. From the compressor, the air is delivered into an annular angle-section trunk with a concentric tier of guide vanes at the elbow, thence being divided into 11 separate combustion-chamber inlet ducts, again with rectifying vanes across the angle, so that the air is once more turned through 180 deg.

Each combustion chamber encloses a fabricated flame-tube embodying a vaporizing volute, and the burnt gases, together with the diluent air, are carried from each chamber down relatively long, slightly tapering extension trunks which terminate at a transfer ring, the eleven ports through which are circumferentially divergent so as to direct the gases into the turbine nozzle ring in an annular stream. After expanding through the two-stage turbine, the gases are exhausted to atmosphere in the usual way.

In dealing with the structural build-up of the Python, it is logical to start with the engine mounting. This is made at four points to a massive box-section ring which bolts up at eleven points on its forward face to the air intake casing. This latter is actually in two parts, the cast ring of eleven entry throats being bolted to an inner cast diaphragm pierced at its core for passage of the compressor driving shaft, then pierced with the ring of eleven ports for passage of the inlet air to the compressor, and

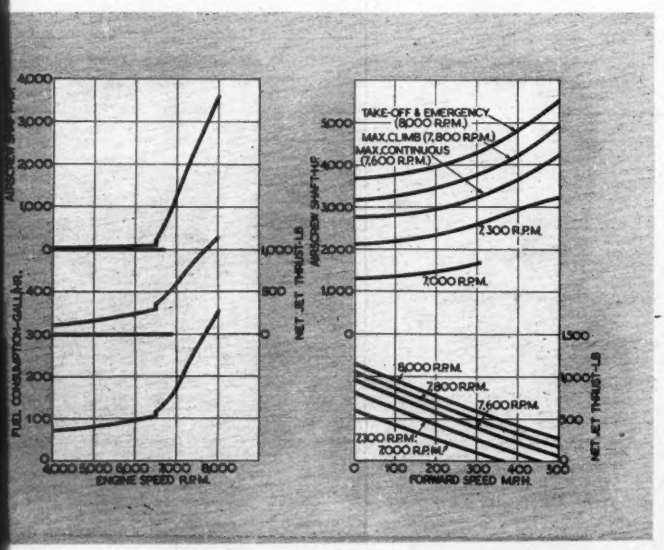
Pythons installed in the outboard nacelles of a Lancaster.





The reverse-flow compressor/combustion system employed on the Python is clearly apparent in the above special "Flight" drawing—as, in addition to the salient features of the unit, are a multitude of subsidiary design points. It is manifestly difficult to dissect (for example) transmission flow paths in the compound reduction gear and air- and gas-flow paths in the combustion chambers, and for this reason amplification of such points is given by detail sketches on other pages.

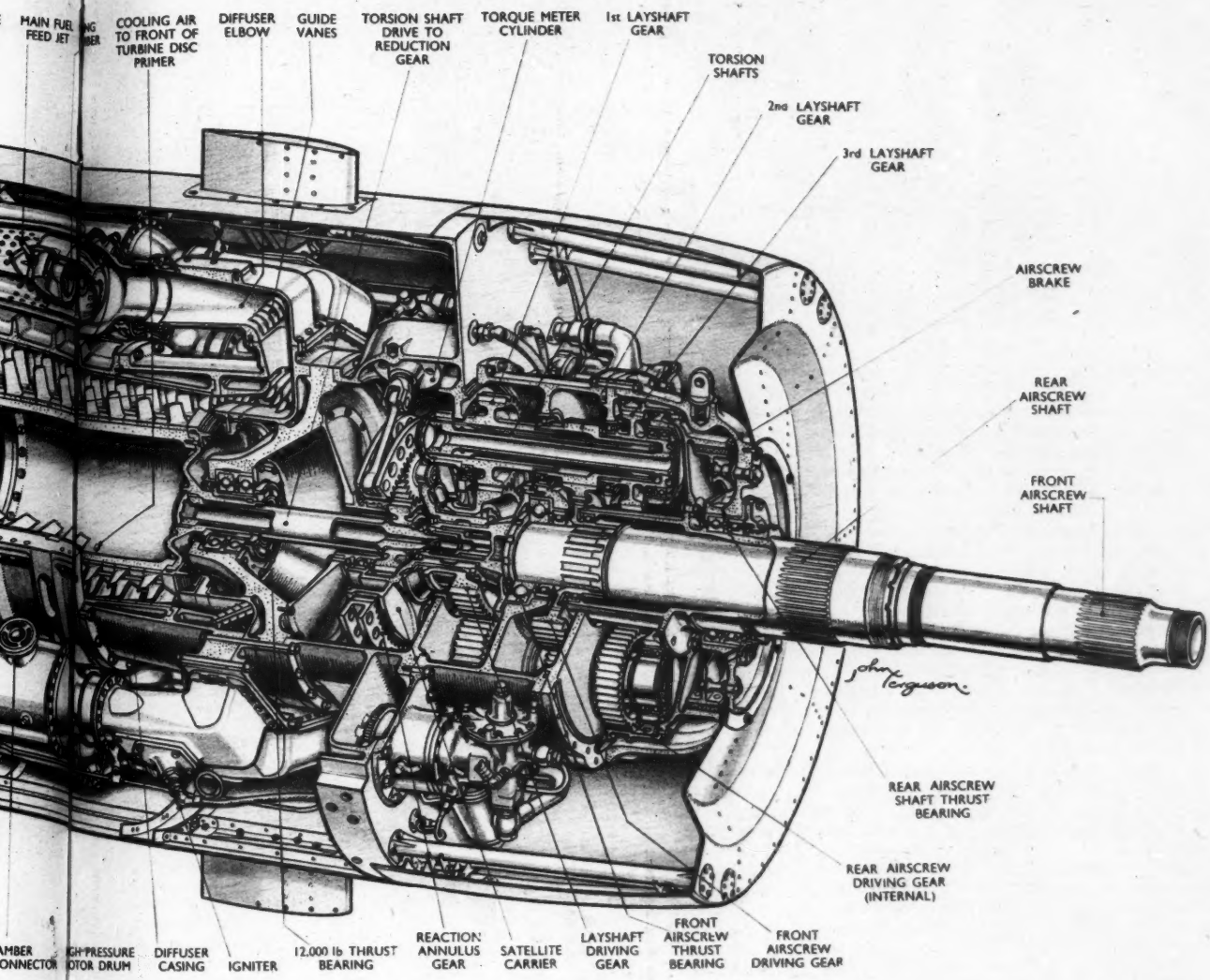
PYTHON . . .



Curves of estimated performance in I.C.A.N. conditions at sea level and (opposite) 20,000ft. Specific fuel consumptions assume an airscrew efficiency of 80 per cent., whilst thrust horsepower (T.H.P.) is based on the sum of the airscrew and residual jet thrusts.

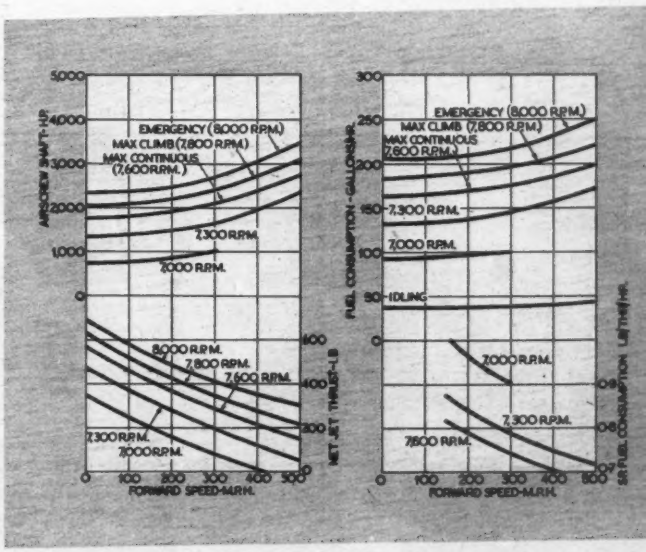
further pierced with an outer ring of eleven ports for passage of the combustion chamber trunks to the turbine. This thick-walled diaphragm acts, in effect, as a root anchorage from which the turbine is supported on the after side, and from which the whole forward mass of the engine is cantilevered through the compressor stator drum bolted on the front face. The compressor drum (which is split longitudinally into halves) is heavily ribbed circumferentially and is rim-bolted at the twelfth stage to the diffuser casing between compressor and combustion chambers, the final three stator stages being embodied in the diffuser construction.

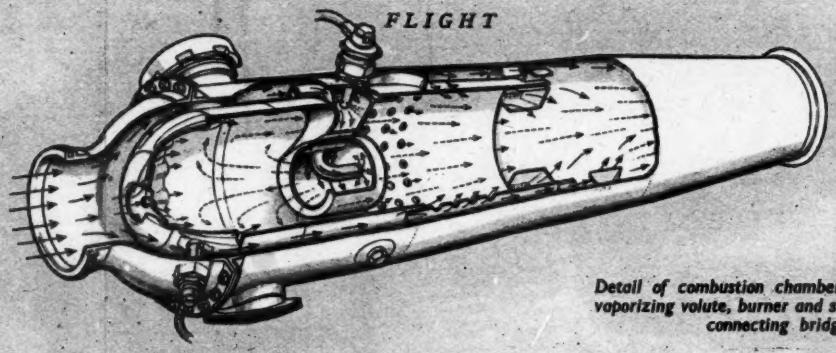
Sandwiched between the diffuser casing and the rearward third of the reduction-gear casing, and through-bolted with each, is a massive cast truncated cone, at the apex (if a truncated cone can be said to have an apex) of which is housed the duplex deep-groove ball thrust-bearing which, with a capacity of 12,000 lb, takes the combined thrust of the compressor and turbine. In the earlier development days of the Python, compressor and turbine thrust was taken by a 7in-diameter modified Michel-type thrust-pad,



relieved by a thrust-equalizer piston device. The thrust pad was ground to an optically flat surface-finish and butted against a complementary pad radially grooved for oil distribution; the oil, in effect, being the "filling" between the rotating and stationary parts of the pad sandwich. This device was capable of coping with a thrust of the order of 18,000 lb, although, in point of fact, it was never called upon to take much more than 8,000 lb, in conjunction with 4,000 lb relief by the equalizer. When, however, Hoffmanns could supply the present form of duplex ball thrust bearing, this was installed in favour of the relative complexity of the thrust pad/equalizer.

To return to our survey of the static construction, the reduction gear casing is divided transversely into three elements, the rearmost of which also embraces the torquemeter housings and the wheelcase and mountings for the various auxiliaries. The middle casing is laterally divided by a diaphragm in which are housed the central bearings of the reduction gear layshafts, and in the centre of which is accommodated the large-diameter single-row deep-groove bearing which caters for the thrust of the front bank of airscrew blades; that is to say, it is located on the tail of the inner airscrew shaft. The foremost section of the r.g. casing is, of course, the front cover, and in addition to accommodating the roller journal and ball thrust bearings for the outer airscrew shaft (serving the inner bank of





Detail of combustion chamber showing flame-tube, vaporizing volute, burner and starting jets, and interconnecting bridge tubes.

PYTHON . . .

blades), also affords anchorage for the hydraulic actuator units of the special airscrew parking brake: we will return to this latter novelty later on.

Before going on to consider the rotating elements of the Python, the "static" picture may fittingly be concluded by a reference to the cowling. Except for the provision of fairing-support "spokes," the use of a long- or short-chord outer cowling does not affect the inner or main cowling of the engine. This is in the form of a stabilized light-alloy skin between the air inlet casing and the forward wall of the auxiliaries wheelcase, and access to the combustion chamber starting jets and fuel burners is facilitated by small individual doors in the cowling. From the auxiliaries wheelcase forward, the cowling cylinder is slightly tapered to match the diameter of the spinner backplate, the complementary endplate of the cowling being of conventional dished form and supported by tubular struts, cantilevered off the wheelcase.

Since, in terms of power production, the turbine is the primary source, in making a survey of the dynamic elements of the engine, it may be as well to start, so to speak, at the fountain head. The turbine disc is relatively thick at the centre ($3\frac{3}{16}$in), but tapers radially before once more widening at the rim for accommodation of the two stages of blading. These, incidentally, are locked in a rather novel way: the rim is firtree-serrated axially, and at the inboard end of each blade-root slot is inserted a small peg or dowel. The inboard end of each blade-root is undercut for accommodation of the peg so that axial movement of the blades toward one another is restrained; the blades are retained in the rim (that is, against axial movement away from one another) by small segmental strips, spot-welded on the rim, each spanning six blade-roots.

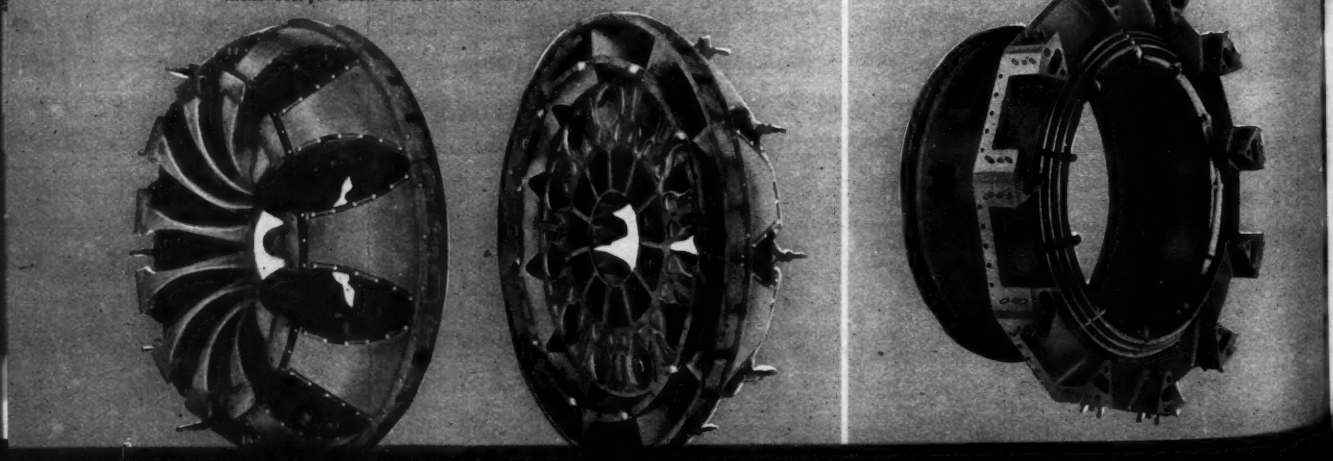
To a shoulder flange formed on the forward face of the turbine disc is bolted a drive transfer unit in the form of a shafted disc, the outer skirt of which is concentrically grooved for a labyrinth seal, whilst the shaft is bore-splined to the driving cone transmitting torque to the compressor. A duplex roller journal and ball thrust bearing assembly surrounds the shaft of the disc and is housed in the mouth of a longitudinally and peripherally ribbed cylinder bolted up to the rear face of the inner member of the air intake assembly; the bearing thus serves not only to support the turbine, but also acts as a tail bearing for the compressor.

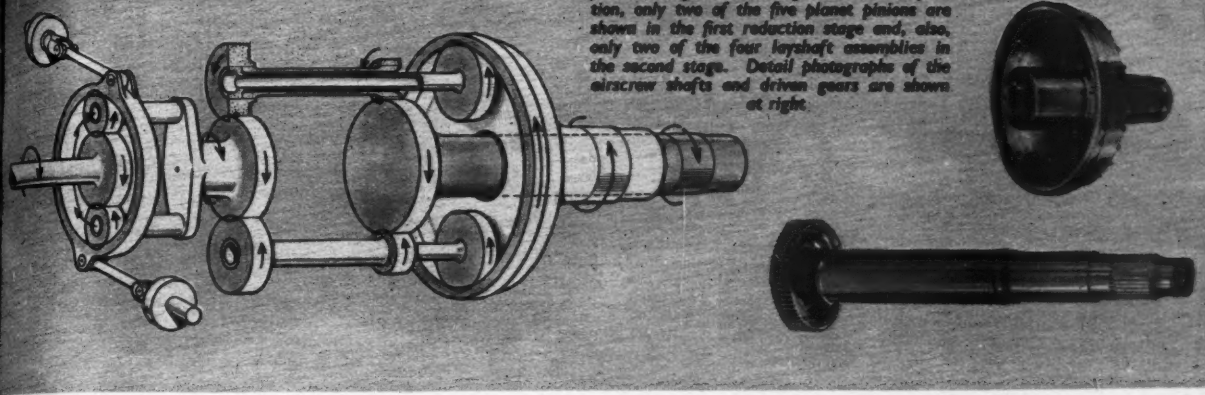
At its forward end, the compressor driving cone is rim-bolted to the after-end of the low-pressure rotor drum. This is also in the form of a truncated cone on which the blading of the first five stages is carried and, at its forward end, is axially rim-bolted to the high-pressure stages rotor drum, which takes the form of a cylinder of uniform diameter. Both low- and high-pressure rotor blades are RR 57 castings. Originally, these were made in RR 56 and were chromic-acid anodized; in order, however, to increase resistance to pitting, which leads to subsequent erosion, a change was made to RR 57 and a sulphuric-acid anodic treatment, which gives a relatively thick protective coat. Finally, the blades are dipped in a silicone-resin lacquer and baked, whereby a smooth and hard surface finish is obtained.

We have already referred to the special 12,000-lb capacity duplex bearing which takes the combined compressor and turbine thrust. This bearing surrounds the shaft of a dished diaphragm enclosing the forward end of the high-pressure rotor drum, and in the bore of the diaphragm shaft is coaxially housed the main input shaft to the reduction gear, torque from diaphragm to transmission shaft being given through semi-circular splines between the two. At its forward end, the main input shaft is serrated to the bore of a sungear with which mesh five planetary pinions reacting against a floating annulus gear located radially by the planet pinions and circumferentially by the connecting rods to the two torquemeter pistons.

The principle of this torque-measuring device is now so well established that we need refer to it only briefly. As the floating annulus is the reaction member for the planetary pinions, it necessarily follows that the anchorage

Fore-and-aft views of the cast, light-alloy air entry casing and (right) the compressor-diffuser casing with ring of rectifying vanes and attachment roots for elbow ducts to combustion chambers.





Schematic diagram of transmission drive paths through reduction gear. For clarification, only two of the five planet pinions are shown in the first reduction stage and, also, only two of the four layshaft assemblies in the second stage. Detail photographs of the airscrew shafts and driven gears are shown at right.

of the annulus will be subjected to the full torque input, and by making this anchorage in the form of a pair of hydraulic piston and cylinder assemblies, the pressure of the oil in each torquemeter can be indicated on a suitably calibrated pressure gauge and so register the power production of the engine. This primary section of the reduction gear is of conventional epicyclic form with a ratio of 0.316 : 1, the shaft of the planet carrier being splined to the bore of a 46-tooth primary gear. Meshing with this last are four quadrantally disposed 36-tooth layshaft pinions, the ratio in this stage being 1.278 : 1.

Each layshaft arrangement is the same; in order both to prevent hunting in the drive and also to facilitate the design of the contra-rotation system, each layshaft assembly consists essentially of a pair of coaxial torsion shafts, each individually splined in the bore of the first, or rearmost, layshaft pinion. The outer torsion shaft is serrated at its forward end to the bore of the second, or middle, layshaft pinion, the tail of which registers over the nose of the first pinion shaft, both being supported in a roller journal bearing carried in the gearcase diaphragm. In similar fashion, the inner torsion shaft is serrated to the bore of the third, or forward, layshaft pinion, this being supported on its after side in a roller bearing housed in the front gearcase diaphragm, whilst the forward side of the pinion is supported in a roller and ball bearing assembly carried in a bridge-piece projecting forward from the just-mentioned case diaphragm.

Final Power-transmission

To deal now with the output side of the reduction gear, the inner of the coaxial airscrew shafts is driven at a ratio of 0.312 : 1 from the four middle layshaft-pinions (20-tooth), each of which meshes with the 64-tooth shaft driving-gear, coupled to a transfer unit splined on the shaft; immediately behind this is mounted the roller and ball bearing assembly taking respectively shaft journal loads and the thrust loads of the front bank of airscrew blades. The outer airscrew shaft is driven in a rather different fashion, in that an epicyclic train is employed. The front layshaft pinions (50-tooth) each mesh with an internally-toothed (160) annulus gear at the periphery of a built-up drum unit axially bolted to a shoulder flange formed on the airscrew shaft; journal loads are taken by a roller bearing, and thrust loads by a ball bearing, together housed as a duplex unit in the front cover of the reduction gearcase. The various ratios between the several elements of the drive equate to an overall reduction ratio of 0.127 : 1.

One of the more interesting development aspects of the Python is vested in the reduction gear for, in the early days, trouble was experienced which was only eradicated after some tortuous investigation. The trouble manifested itself in the form of a curious pitting adjacent to the oil holes and grooves in various bearing bushes in the reduction gear, and it took quite a little time to discover that this was, in fact, cavitation erosion. The source was eventually traced to a tooth form which produced a very high-frequency vibration which the bearing oil film attempted to damp. In that oil is for all practical purposes virtually incompressible, the result of it all was to impose on the bushes what could, perhaps, best be likened to a continuous series of ultra-rapid hammer blows which led to a break-down of the lead-bronze bush material.

Some amelioration of the trouble was found by the use of harder bushes, but this was an interim measure, and the final cure was not effected until the tooth form was slightly modified to eliminate the vibration.

The reduction gear cannot well be left without reference to the entirely new feature of an airscrew brake. The purpose of this, of course, is to prevent the engine being "motored" by the airscrew acting as a windmill when the aircraft is at rest. This is no small point, particularly with regard to naval work, when the aircraft might be parked on deck in winds of anything up to 40 kt. The drum through which the outer airscrew shaft is driven is flanged to provide what is, in effect, also the brake drum, and, in conjunction with this, a twin-shoe Lockheed brake is employed, the shoes being expanded by hydraulic piston/cylinder units which are anchored inside the front cover of the reduction gearcase.

Operation of the brake is entirely automatic and coincident with airscrew feathering. When the isolator valve in the engine fuel system is actuated, i.e., whenever the engine is shut down, either in the air or on the ground, the airscrew feathering system is automatically energized to feather the airscrew. (This introduces the rather novel departure that, aside from the automatic feathering with a dead engine when airborne, the same thing happens in normal everyday operation, i.e., when the engine is shut down after landing, the airscrew is automatically feathered —and in this particular case, braked as well.)

The oil for actuation of the brake units is supplied from the feathering pump; toward the end of the feathering operation, the pressure in the feathering system rises rapidly, and this is arranged to operate a check-valve in order to actuate the brake. The design of the check-valve is such that the pressure in the braking system is "locked" until the fuel system isolator valve is again opened.

Whilst on the subject, a word or two might be given on the Rotol airscrew, an eight-bladed, contra-rotating, hydraulic unit of constant-speed, feathering and reversing type. One of the essential requirements of the direct-coupled turboprop engine is that the airscrew must incorporate an ultra-fine blade pitch-angle for starting purposes. In the Python airscrew, this feature is provided by making the normal fine-pitch stop automatically withdrawable. This lock is also withdrawable in order that the blades can be turned to give reversed thrust for braking. Another feature of the airscrew which is worthy of note is the incorporation of a special "windmill" brake pitch for use with dive-bombing aircraft. Drag given by the windmilling airscrew is such that it should materially ease the design of dive-brakes, and even, in some instances, render their employment unnecessary.

When Armstrong Siddeleys started their original investigations into gas-turbine design and were faced with the combustion problem, they went at once to the root of the matter and reasoned that the most efficient combustion called for the finest division of the fuel. The most practicable way of obtaining division down to molecular order

PYTHON . . .

was by vaporization. Furthermore, as the speed of combustion is dependent upon the initial temperature of the mixture, it pays to have this as high as possible—again pointing the way to vaporization.

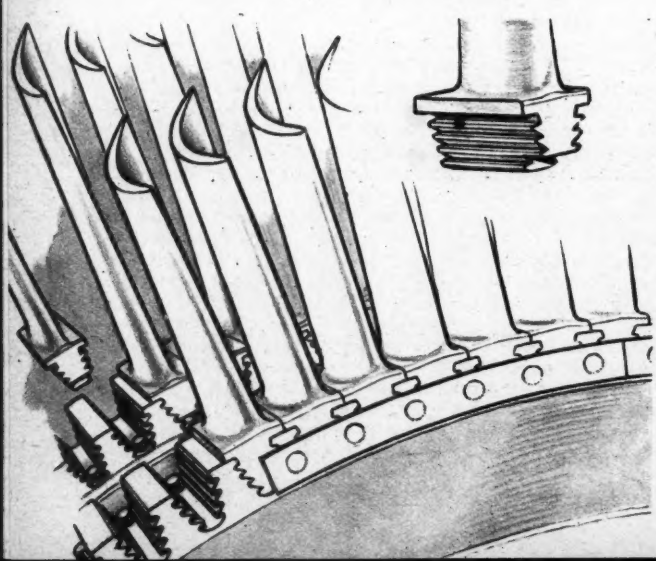
The construction of the combustion chamber and the air- and gas-flow paths can be seen in the illustrations. Housed coaxially within the combustion chamber is a dome-headed flame tube incorporating a vortex vaporizer. Air delivered from the compressor enters the upstream mouth of the combustion chamber, the greater percentage of it passing through the annular passage between the flame tube and outer casing. The air required for combustion of the fuel is admitted to the flame tube in a variety of ways; the vaporizer volute has a ram intake aperture projecting into the annulus between flame tube and casing, and in passing into the vaporizer, the air picks up fuel from the four-hole jet which projects into the ram throat.

This primary charge is considerably too "rich" for complete combustion, but it spills over the sharply edged orifice in the forward face of the vaporizing volute and, on entering an envelope of burning gas, combustion of the charge is started. The jet of mixture travels up the flame-tube toward the baffle-plate behind an inlet aperture in the crown of the flame-tube dome. Air admitted through this hole is diffused by the plate into a continuous sheet which flows initially in a direction parallel and close to the surface of the flame-tube, so forming an insulating layer between the metal and the flame, as well as gradually adding fresh air to the burning charge. As the burning gases are turned back by the curvature of the dome, further air is added through a series of shoulder holes at the tangent point between dome and tube.

The turbulence produced by this method of air introduction accelerates the combustion and, in fact, combustion is substantially completed when the gases pass around the outer surface of the vaporizer. Then, in order to ensure that air is available in excess of that required for combustion at the richest operating mixtures, further air is added through rings of holes around the flame-tube lower trunk. (Incidentally, an insulating film of cold air is introduced immediately upstream of the first ring of holes to alleviate the effects of high temperature on the material of the flame-tube. Curiously enough, this boundary layer flow does not affect the airflow through the holes.)

As the Python has abnormally long combustion trunks, it has been possible to keep the mixing losses low. The process is initiated by four rectangular deflectors on the interior surface of the combustion chamber, immediately downstream of the flame tube; these direct wedges of cold air into the centre of the flame and cause an eddying motion which persists down the duct to the turbine. The resulting peak temperature at the entry to the turbine is approximately 4 per cent higher than the mean temperature.

The method of retaining turbine blades by pegs and spot-welded segment strips is a novel feature of the Python.



Two of the Python's eleven combustion chambers are fitted with torch igniters (which are virtually sparking plugs through which fuel is sprayed), the remaining nine chambers being fitted with starting jets. When the engine is started, the total fuel pump delivery is given to the torch igniters and starting jets until such time as the engine has speeded up sufficiently for a 50 lb/sq in difference to be given across a valve in the fuel delivery line, at which point the valve opens and passes fuel to the main burners. Then, when running is stabilized, a solenoid valve cuts off supply of fuel to the igniters and starting jets. The starting jets produce a fuel/air mist in each of the nine combustion chambers, whilst the torch igniters in the remaining two chambers produce a flame in the chamber head, this flame spreading rapidly through the bridge tubes interconnecting the chambers, so igniting the mixture sprayed in by the starting jets.

The fuel pump fitted to the Python is a Lucas C-size swashplate unit which delivers through a flow control unit of Armstrong Siddeley design. Fuel is thence given to an isolator which is, in fact, virtually a high-pressure cock, and from which a line is taken off to the torch igniters and starting jets. The main fuel flow from the isolator goes to a distributor via a pressure-increasing valve (both of Armstrong Siddeley design), the latest type of which employs gradient slots, so that the curve of fuel pressure plotted against flow for the main burners can be made substantially linear. The pilot has a single-lever control which jointly operates the fuel flow control units and the airscrew constant-speed unit via a hydraulic controller. Movement of the pilot's lever alters, through a cam, the setting of the flow control unit to govern the amount and rate of fuel supply to the burners. Into this linkage is tied a hydraulic vane-type follow-up servo which, through another (matched) cam, alters the setting of the c.s.u. governor.

The purpose of this form of control is that, when opening the throttle, the airscrew blade pitch will *coarsen* rather than fine-off during the acceleration and so prevent the hunting which would occur when the selection of full throttle made full fuel flow available. The maximum fuel flow is of the order of 400 gall/hr, and, as the Python requires no more than 150 gall/hr at 8,000 r.p.m. when the airscrew is in fine pitch, without the incorporation of this system to deceive the airscrew, so to speak, the constant-speed unit would try to overspeed, which would in turn bring in the overspeed governor of the fuel pump to shut down fuel flow, so causing the r.p.m. to drop, whilst the airscrew blade pitch continued to coarsen, so opening full fuel flow again to continue the unhappy cycle. By building deceit into the control, however, the increment of engine r.p.m. is matched with the acceleration characteristics of the airscrew.

C. B. B-W.

PYTHON DATA

Max. dia. over cowling	54.5in
Length, from C/L of front A/S blades to end of exhaust cone	182.67in
Minimum length of exhaust cone	26in
Dia. of jet pipe, lagged	25in
Net dry weight	3,150lb

Summary of Sea Level Performance

Rating	Engine r.p.m.	Speed, m.p.h.	Airscrew s.h.p.	Net jet thrust	Fuel cons.
Max. take-off	8,000	0	3,670	1,150	355
Max. climb	7,800	100	3,260	850	322
		200	3,450	660	329
		300	3,800	490	342
		400	4,230	320	357
Max. cont. cruise	7,600	200	2,960	570	296
		300	3,260	390	304
		400	3,680	220	321

CIVIL AVIATION NEWS

Traffic-Control Radio Requirements : B.O.A.C. Canadairs' Early Start : Corporations' March Statistics

JUNCTION AIRPORT : A Soviet Air Lines (Aeroflot) modified C-47 unloading passengers at Helsinki on arrival from Leningrad and Moscow. There is a twice-weekly connection with the S.A.S. services to and from Stockholm. The entrance is on the starboard side, in conformity with standard Russian practice.

IDLEWILD SETTLEMENT

BRITISH Overseas Airways Corporation were represented, together with three American airlines, at a conference on August 5th to discuss the possible use of Idlewild Airport (Long Island) in place of LaGuardia as the airport for New York. After prolonged discussion with Governor Dewey, an agreement was reached on all the points at issue, and it is understood that the full facilities at Idlewild will be made immediately available on a voluntary basis to the airlines represented. It is reported that four other companies, originally involved, will be encouraged to subscribe to the agreement.

The controversy originally arose when the Port of New York Authority, on assuming control of Idlewild, sought to modify the terms of leases which had been concluded between the City and the airlines for the use of LaGuardia. The airlines insisted that the leases were valid and have subsequently continued to use LaGuardia. Permanent leases for the use of Idlewild are likely to be signed in October.

TEMPORARY INDIAN AGREEMENT

THE British and Indian Governments have agreed to a temporary arrangement to govern the operation of authorized British and Indian airlines between the two countries. The arrangement was reached at the recent air talks, but discussions on a long-term bilateral agreement have been suspended and will be resumed within the next 12 months. It is understood that no agreement was reached on the capacity of services to be operated, and on several other points.

The temporary agreement provides for the continued operation of existing Indian and United Kingdom services, and also allows for a measure of development as a result of the re-equipment and reorganization of B.O.A.C., and for some expansion by Air India International. The latter company is permitted to operate a scheduled service to East Africa.

TRAFFIC PLANS

THE Ministry of Civil Aviation has outlined the policy upon which basic traffic control and navigational services will be developed in the United Kingdom during the next two to three years, and upon which regulations governing the carriage of radio equipment in aircraft will be based. Aids to final approach and landing have not yet been dealt with. This general statement of policy provides a warning of the new regulations, so allowing sufficient time for the production and installation of equipment to meet the minimum scale to be carried in all aircraft flying under I.F.R. when standardization of approved navigational systems has been agreed.

The use of the medium-frequency band for air-to-ground communications will contract rapidly in the near future as a result of the implementation, during 1950, of the new international frequency allocation plans. The first ground stations to be withdrawn will be those in South-Eastern England and then progressively in the North and South-West of England, followed by Scotland. The D/F facilities associated with this frequency band will be withdrawn also.

Provision of V.H.F. R/T. equipment for airfield and approach communications at M.C.A. airfields is now virtually complete and it is intended that all short-distance communications shall eventually be conducted within that band. H.F. W/T. will ultimately be used only for long-distance communications and developments may show an increasing possibility for using H.F. R/T. also for long-distance communications. Facilities for airfield control on this band have recently been placed on a "request only" basis, and it is intended to withdraw H.F. R/T. airfield control facilities as soon as the development of V.H.F. R/T. permits.

Basic navigational services will be provided by employing the available medium frequencies for the increased use of radio range and the M.F. non-directional beacons. Control areas in the form of airways—defined by radio ranges and M.F. beacons—are being set up, but there will not be sufficient medium frequencies to provide a complete system of check points, so the latter will be defined throughout the country by V.H.F. fan markers.

The whole plan will probably begin to take effect during 1949 and will be completed in 1950-51. V.H.F. D/F. will continue to be available at many airfields, but the ability to use this facility alone will not continue to be sufficient for air-traffic control purposes under I.F.R. in control areas, and in control zones associated with major airports.

It is intended progressively to extend the system of positive control of air traffic throughout the country. With the growth of air traffic needing I.F.R. clearance in control areas and zones it will probably become necessary by 1950 to require each aircraft to carry a minimum scale of equipment in the form of V.H.F. R/T., M.F. receiving equipment and associated D/F. facilities, and V.H.F. receiving equipment for the 75 Mc/s fan marker signals. The use of Gee and Decca will continue to be acceptable for traffic control.

For international flying it is thought probable that full operational flexibility will be achieved only if aircraft are capable of communicating on at least 19 V.H.F. R/T. frequencies. In the United Kingdom full use of airfield, approach and *en route* facilities will be achieved only if communication is possible on ten frequencies. In the interests of safety it is anticipated that aircraft having less than the full facilities will be restricted to those routes on which their equipment will allow communications to be maintained. Since the M.F. band is being used more for navigational facilities, great importance is attached to the incorporation of better selectivity characteristics in new airborne M.F. receivers.

CANADAIRS' EARLY OPERATION

TAKING advantage of the early delivery of their new Canadair fours, known as the Argonaut Class, B.O.A.C. will introduce its first landplane services between the United Kingdom and the Far East on August 23rd. At 0930 G.M.T. on that day, a service to Hong Kong will open on a weekly basis. Night stops will be made at Karachi and Rangoon, and refuelling stops at Rome, Cairo, Basra, Calcutta and Bangkok; Hong Kong will be reached at 0840 hours G.M.T. on August 26th. The total journey time will occupy three

Civil Aviation News . . . . .

days, compared with five taken by the Plymouth flying boats.

A weekly service to Tokyo will be opened at 0930 hr on August 26th, arriving at Tokyo at 0650 hr G.M.T. on August 30th—a four-day journey compared with six by the flying boat. Night stops will in this case again be at Karachi and Rangoon, with another at Hong Kong, and there will be the same refuelling stops. Return services will leave Hong Kong every Tuesday and Tokyo every Thursday, but an additional night stop will be made at Cairo.

The Short Plymouth flying boats now operating to the Far East will be withdrawn, so that, without expensive marine bases to be maintained, a substantial saving is expected.

It is understood that Sir Miles Thomas has called for a report from B.O.A.C. technicians on "the operational and economical possibilities of using a six-jet flying boat with seats for 50 or 60 passengers that will fly at about 400 m.p.h. above the weather on Commonwealth or Transatlantic routes."

DROVER C. OF A.

IT has been announced in Australia that the de Havilland Drover, modified according to suggestions made during the trials of the original prototype, has now received its Type Certificate from the Civil Aviation Department. Metal-bladed, variable-pitch airscrews have replaced wooden ones, and the engines have been modified. It is understood, also, that the mainplane dihedral has been increased and the wing root fillets have been altered.

With six passengers at 5,000ft and at the maximum economical cruising speed of 142 m.p.h., a still-air range of 560 miles is claimed; with eight passengers, and allowing 30 lb of luggage per passenger, and at a cruising speed of 128 m.p.h., the still-air range is stated to be 310 miles. With an all-up weight of 6,500 lb, the take-off run at sea level is 930 yd; at 2,500ft it is 1,090 yd, and at 5,000ft it is increased to 1,300 yd. Maximum rate of climb at sea level is 835 ft/min whilst the absolute ceiling is 16,000ft.

AUSTRALIAN PROPOSAL

THE Australian Air Pilots' Association is seeking the establishment of a panel of technical experts, independent of the Department of Civil Aviation, to investigate aircraft accidents. Plans for a board of enquiry consisting of two aviation experts and a legal representative, with equal status, and the right to examination have been submitted to the Department. The Association considers that it should have representation on any committee investigating accidents.

At a recent meeting of the Association's Federal Council in Melbourne, a proposal to ban Communists and Communist sympathizers from membership was withdrawn on the grounds that the Association was a non-political, professional organization. The Secretary of the Australian Air Pilots' Association has said, however, that members who professed subversive views or intentions would not be tolerated. The Association has a membership of more than 600.

British Airways' Operating Statistics for March, 1949

(Figures for the corresponding period in 1948 are given in parentheses)

	B.E.A. All Divisions	B.E.A. British Division	B.E.A. Continental Division	B.O.A.C. All Divisions	B.O.A.C. Western Division	B.O.A.C. Eastern Division	B.S.A.A.
Passengers carried	34,185 (31,211)	18,570 (19,672)	15,615 (11,539)	10,455 (10,109)	2,257 (2,533)	8,198 (7,576)	2,504 (1,361)
Cargo carried ;							
Mail (tons)	264.7 (132.0)	98.4 (83.8)	166.3 (48.2)	133.9 (152.2)	29.3 (23.8)	104.6 (128.4)	16.1 (15.4)
Freight (tons)	427.2 (293.4)	110.3 (90.6)	316.9 (202.8)	272.0 (257.9)	47.0 (46.9)	225.0 (211.0)	61.5 (53.6)
Average load ;							
Passengers (No.)	11.8 (11.6)	10.1 (7.8)	12.7 (15.1)	17.3 (13.2)	28.1 (20.2)	16.1 (12.3)	8.9 (9.3)
Total (lb)	2,802 (2,631)	2,086 (1,550)	3,110 (3,503)	5,239 (4,058)	6,382 (6,232)	5,071 (3,808)	3,458 (3,981)
Average capacity ;							
Seats (No.)	19.3 (17.7)	16.9 (14.5)	20.6 (20.7)	25.8 (20.0)	41.0 (41.1)	24.2 (17.4)	20.6 (18.7)
Total (lb)	4,474 (4,037)	3,485 (3,087)	4,899 (4,805)	8,188 (6,090)	9,776 (11,030)	7,955 (5,522)	8,271 (6,832)
Average length of haul (miles) ;							
Passenger	317 (292)	171 (151)	482 (522)	2,969 (2,838)	2,278 (1,976)	3,151 (3,121)	907 (2,973)
Mail	455 (357)	171 (143)	622 (728)	4,749 (4,264)	3,697 (3,296)	5,043 (4,443)	4,655 (5,925)
Freight	533 (549)	189 (152)	653 (726)	3,856 (3,129)	3,221 (2,848)	3,988 (3,192)	2,994 (5,864)
Hours flown :							
Revenue ; Passenger services ...	6,199 (5,561)	2,611 (3,088)	3,588 (2,473)	9,000 (11,404)	756 (996)	8,244 (10,408)	1,244 (2,082)
Cargo services ...	660 (324)	— —	660 (324)	1,018 (898)	398 —	620 (898)	285 (84)
Charter and special flights	93 (98)	93 (98)	— —	341 (551)	— (142)	341 (409)	548 —
Non-revenue	266 (260)	105 (184)	161 (76)	854 (1,576)	120 (616)	734 (960)	249 (158)
Equivalent annual utilization (revenue hours flown) per aircraft	1,051 (1,023)	899 (983)	1,180 (1,078)	1,212 (1,240)	— —	— —	1,433 (1,527)
Unduplicated route miles in operation at end of period	11,885 (13,044)	2,387 (3,789)	9,498 (9,255)	60,955 (58,318)	6,916 (8,523)	54,039 (49,795)	12,926 (18,375)
Percentage regularity	95.9 (95.5)	95.9 (95.8)	95.8 (94.4)	95.9 (96.8)	87.7 (84.5)	97.2 (98.0)	98.3 (96.2)
Average length of stage flights (miles)	203 (176)	105 (109)	380 (397)	1,036 (891)	1,075 (1,172)	1,031 (867)	773 (1,167)

AS would be expected, there was a general increase in the amount of traffic carried by the British Airways Corporations in March compared with February, 1949. There was also a slight increase in the number of passengers carried on most routes compared with March, 1948, although it is surprising that the B.O.A.C. Western Division carried fewer passengers in March this year than in March, 1948, and only a few more in all the divisions combined. There is, however, a marked improvement in the average load carried in the B.O.A.C. Western Division. Route mileages have decreased in B.E.A. but increased in B.O.A.C., largely through extended services in the Eastern Division.

The Ministry of Civil Aviation statistics include also provisional assessments for the year April, 1948, to March, 1949. The three Corporations together carried 718,000 passengers, 8,600 tons of freight, and 4,600 tons of mail. These figures are respectively 15 per cent, 53 per cent, and 41 per cent higher than those for the year 1947-48.

Passenger-miles flown totalled 565 million, an increase of 20 per cent, the freight ton-miles rose by 40 per cent to 16 million, and the mail ton-miles were over 10 million, an increase of 16 per cent on the previous year. The Corporations offered a capacity of 129 million ton-miles, out of which the revenue load ton-miles totalled 70 million. The overall revenue load factor fell from 64.4 per cent to 60.9 per cent. Final results of the three Corporations for the year, in terms of revenue and expenditure, will be given in due course in their annual reports.

PAKISTAN AIR AGREEMENT

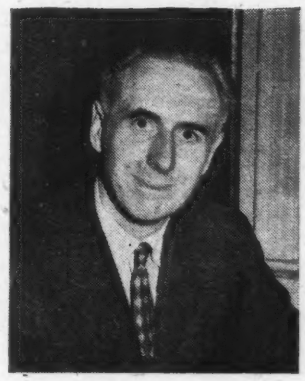
AN air transport agreement between the Governments of the U.K. and Pakistan was signed at Karachi on July 27th. It provides for the exercise of traffic rights by the lines of each country in the territory of the other on agreed routes and on a reciprocal basis. The agreement resembles others which have recently been concluded between Pakistan and other countries.

TRANSATLANTIC TOURS

AMERICAN OVERSEAS AIRLINES have introduced two-week Transatlantic tours in Europe for Americans. The cost, including meals, hotel accommodation, transport, sight-seeing excursions and tips, varies between £2 and £4 10s a day. One typical tour covers the European capitals, with two days in London, one in Windsor, two in Paris, one in Versailles, two in Brussels and a day each in Ghent and Bruges, The Hague and Amsterdam. Another tour covers Frankfurt, Heidelberg, Freiburg, Lucerne, Genoa, Nice, Monte Carlo, Paris, Versailles and London.

NEW B.E.A. DIRECTOR

THE Minister of Civil Aviation has accepted the resignation of Mr. I. J. Hayward from the Board of B.E.A. because of the increasing amount of time he finds it necessary to devote to his work as Leader of the L.C.C. Lord Pakenham has appointed Mr. Aubrey C. Ping to take his place with effect from September 1st. Mr. Ping has been released by the Railway Executive from the post of Assistant for Special Purposes and Development of Traffic to the Continental Superintendent of British Railways, Southern Region, in order to take up this new appointment.



Mr. Aubrey C. Ping.

He was, at one time, a Southern Railway representative to Railway Air Services and Channel Island Airways, and was associated with Lord Douglas in his recent enquiry into the operation of Section 23 of the Civil Aviation Act. Mr. Ping is said to have specialized in problems concerning rail-associated air routes and the development of traffic facilities through the co-ordination of air and surface transport. In B.E.A. he will have special duties in connection with labour relationships and the co-ordination of air and surface transport.

BREVITIES

SOUTH African Airways has been granted permission to operate services between the Union and the United States and also between the Union and the Netherlands.

* * *

Lancashire Aircraft Corporation recently withdrew its Halifax tankers from the Berlin Air Lift. During the operation, 9,000 hours were flown and nearly 5,000,000 gallons of diesel oil were carried into Berlin.

* * *

A new company, International Aeradio (East Africa), Ltd., is to be formed in conjunction with the East African Airways Corporation by International Aeradio, Ltd., London. Air Commodore C. S. Cadell, managing director of I.A.L., left by air on August 4th for Nairobi to discuss the formation of the new company, which will be concerned initially with setting up a radio maintenance organization similar to those already established at Bovingdon, Cairo and Karachi.

"CITY OF BELFAST": In the presence of the Prime Minister of Northern Ireland, the Lord Mayor of Belfast recently christened a Short Solent flying boat—destined for B.O.A.C.—after the city of its manufacture. Sir Miles Thomas accepted a plaque of the city arms to be installed in the aircraft.

* * *

It is claimed that in June the highest passenger traffic ever recorded in one month was achieved by American Airlines and A.O.A. when 156,009,534 passenger-miles were flown. The passenger load factor was 73.4 per cent.

* * *

Forty-nine senators have asked President Truman to hold up the agreement with Canada which grants Canadian airlines the right to fly on the Montreal-New York route. It is alleged that the agreement was reached by secret negotiation and that U.S. lines were deprived of valuable property and other rights without the opportunity of being heard.

* * *

The South African Government has given permission for the extension of Port Elizabeth Airport. It is considered necessary to lay down runways as soon as possible, and the Government has given priority to Port Elizabeth at the expense of the development of eight other airfields.

* * *

It is understood that the New Zealand Government is providing £85,000 to meet the operational costs of Tasman Empire Airways for the year ended March 31st. A grant is also required to meet £21,733 deficiency incurred by the National Airways Corporation in the Pacific regional services.

* * *

On the Aer Lingus Dublin-London service 150 flights are being flown each week during the peak period. The Company's Dublin-Glasgow route has been carrying 41 per cent more passengers than during the same period last year and traffic on the new Dublin-Birmingham route rose sharply towards the end of July. The Irish airline is operating special passenger-cum-freighter services with its DC-3 aircraft.

* * *

For the week ended July 31st, B.E.A. bookings amounted to 11,495. Of this total 5,523 were for Continental routes, 1,835 passengers travelled on B.E.A. internal services, and 1,915 on flights to the Channel Islands. Passengers accommodated in other companies numbered 1,330 and a further 892 made miscellaneous journeys. During the same week, a total of 22,365 passengers passed through Kensington Air Station; of these 12,732 were departures and 9,633 were arrivals.

* * *

Pilots are reminded that on and after April 1st, 1950, an instrument rating will be obligatory for those flying in control areas and control zones under Instrument Flight Rules. Tests are carried out by the M.C.A. Flying Unit (now at Stanstead)

Civil Aviation News . . . . .

and by certain pilots selected and authorized for the purpose, as in the case of the Corporations and their subsidiaries. It has been decided that no wider delegation of authority to conduct these initial tests will be made.

* * *

Passengers travelling to Ringway will find that the sub-branch of the Midland Bank there is open from 10 a.m. to 8.30 p.m. daily except Sundays. The Bank now provides a complete service at Northolt, London Airport and Croydon, while the Bank's affiliate, the Clydesdale Bank, Ltd., has a branch at Prestwick.

During June, B.E.A. carried 77,734 passengers, an increase of 14,241 over the figure for the same month last year. Of the extra passengers, 11,465 were carried on the Continental routes. The number carried on the internal routes is nearly half as many again as that on the Continental.

* * *

An air services agreement replacing existing agreements was recently initialled by the Canadian Minister of Transport and Mr. Lindgren. The agreement, which will permit the operation of several new services by air lines of both countries will, it is hoped, shortly be signed in Ottawa. Routes include services between Canada and Hong Kong and between Britain and Hong Kong.

FROM THE CLUBS

THE Southend Municipal Flying School has now received approval from the Ministry of Civil Aviation for its 30-hour course for the Private Pilot's Licence. During July, 244 hours were flown and once again quite a number of the school's aircraft were flown to the Continent. Lord Waleran and Mr. Bernard Collins, the airport manager, took a Proctor to the Rally at La Baule. An Auster has been fitted for glider-towing and was used recently to return to base a glider which had reached Southend from Dunstable Downs.

* * *

OWING to poor weather conditions during the Bank Holiday week-end, the landing competition organized by the South Coast Flying Club was cancelled. Shoreham was busy during Goodwood race-week, when quite a number of owners and jockeys found it a convenient airfield for the racecourse. Holiday-makers at Brighton and neighbouring resorts are taking advantage of the 10s flights, organized by the Club, in order to see the Sussex Downs and coast from the air.

* * *

SEVERAL ultra-light aircraft clubs are experiencing difficulty in finding suitable airfields. The Aerotech Club at Hayes has been requested to stop glider towing at Elstree, and an alternative ground is being sought. Similarly, the Community Flying Club, Reading, has been given notice to leave Woodley; members have recently flown a considerable number of hours in the Club's Piper Cub and Moth Minor.

The South Hants Ultra-Light Aero Club has been operating an Auster—the property of one of its members—at 30s an hour, and there is some hope of acquiring a Piper Cub on which members hope to fly at an even lower rate. It is understood that the Club is organizing an air display on August 20th, to be held at Christchurch.

* * *

FOURTEEN aircraft, including Piper Cubs, Austers, a Proctor, a Miles Monarch and a Rapide, carried 43 members of the United Services Flying Club to the Tours Rally during the week end of July 21st-24th. The Aero Club de Touraine had previously sent an invitation to U.S.F.C. at Elstree, and the entire Club fleet with several private owners and the Rapide which had been hired for the occasion, went across. A number of the pilots had less than 100 hours' flying experience.

According to reports, the party were entertained in a magnificent fashion and took part in the town's Wine Festival and many other celebrations. Contingents from clubs in Switzerland, Belgium and France joined the Rally, but the U.S.F.C. was awarded the Stella Trophy for the largest representation. Most of the entrants left on Friday night and returned to England on the following Monday.

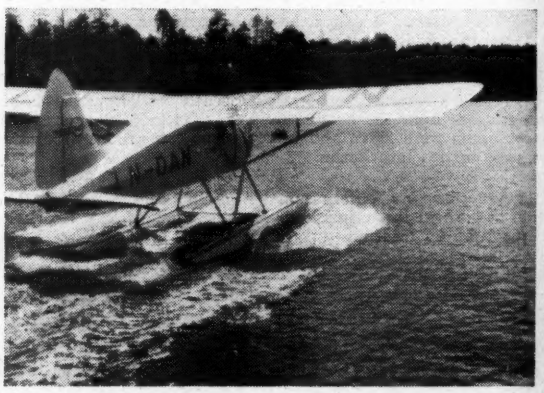
The Club is particularly proud of the achievement of Mr. J. N. Somers in winning the King's Cup, for he is one of its members.

* * *

THE London Gliding Club has reported a growing interest in gliding and an increase in Club membership. In an effort to pass on knowledge accumulated by experienced members, several ideas are being followed up, one of which is the recording of useful information in a "gen" book, to be properly bound and kept in the clubhouse, where it will be readily available to all members. The Club has already started regular Saturday evening lectures at the end of the day's flying. Most of them are given in the Clubhouse by particularly well-qualified members, and last week-end Mr. J. M. Hands was due to talk about the Tephigram, and to explain to the uninitiated how it works. Several films will be shown on August 20th. The third holiday course of gliding was held from June 23rd to July 4th and was attended by 12 members; four "A," eight "B" and seven "C" certificates were awarded.

A British national gain-in-height gliding record in Category 2 (multi-seaters) was established on July 24th by Messrs. James Grantham and Basil E. Bell of Cambridge Gliding Club. Flying in a Kranich two-seater they climbed 10,080 feet after casting off, so beating the previous record of 8,399ft. As the absolute altitude record in this category had not previously been established, that record may also be claimed for the same flight. In Category 1, for single-seaters, the British national record for gain in height is 15,247ft and the absolute altitude record is 16,668ft.

Mr. Philip Wills, President of the B.G.A., has claimed his speed of 47 km/hr, established on July 22nd, 1948, during the national contests, as the record over a triangular circuit of 100 kilometres



WATER LARK: The owners of this Danish KZ III Lark, Wideroes Flyveselskap, who fitted the twin floats, claim a take-off distance in calm water and into a slight wind, equal to that of the landplane version. With the aircraft lightly laden—all-up weight 1,145 lb—the take-off time is said to be only 4 seconds.

YPENBURG AVIATION WEEK

THE Netherlands Minister of Transport, Mr. G. W. Spitzen, performed the opening ceremony at the exhibition which was the principal feature of the first International Aviation Show at Ypenburg. In his speech he referred to pioneer work in aircraft construction by Fokkers (celebrating their 30th anniversary), and, on the operation side, by K.L.M. He also gave some account of the birth and growth of Ypenburg Airport, which is shortly to become a fully-equipped alternative for Schipol, and the airport for the Hague and Rotterdam.

The event was sponsored by the Dutch firm Avio Diepen N.V., the operators of Ypenburg Airport and the parent company of a number of subsidiaries, chief of which is the charter company Aero Holland. In the static exhibition, which was open to the general public, a Hawker Sea Fury of the Royal Netherlands Naval Air Force and an Auster were shown. On the opening day, participants in the Benelux Rally arrived to attend the inaugural dinner at Scheveningen which preceded their tour of the Benelux territories, passing through Liege, Luxembourg, Ghent and Ostend. Throughout the remainder of the week, competitions and displays were held on each day; the items included a race for passenger-carrying balloons. A full day was devoted to model aircraft and another for gliding, the latter programme including public passenger flights in sailplanes.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

THE KING'S CUP RACE

Has it Lost its Identity?

WE have seen this once "Circuit of Britain Race" reduced to the absurdity of a quadrilateral course, with five miles or less on each leg; any fast machine has to do a circle on a continual bank or skid "out of the county"!

May one suggest to the Air Ministry that next year they insist on its being flown inside Olympia or the Albert Hall, where it will even less endanger air traffic?

If the ruling powers get "rattled" in the present pathetic amount of passenger flying in this country, what, in Heaven's name, will they do when our air becomes really busy, as it most certainly will do? JAMES HEMBROW.

Mitcham, Surrey.

THAT PIONEER AIRCRAFT

More Recollections of Early Days Near Ealing

I WONDER if this is the answer to the letters of Mr. Louis Cassera and others on the subject of a "Peep over the Wall in 1908." About that time Piffard had a biplane, with Green (?) engine, housed in a hangar in a field at the top of Twyford Avenue, and on the Park Royal side of the G.W. Railway at Acton. This could probably be the aerodrome seen from Coronation Road.

My own recollections—and I spent many hours in the hangar, as an uninvited but welcome addition to the staff, when it came to pushing the aircraft around—was that he never succeeded in getting it to leave the ground.

I believe Piffard then moved to Shoreham and the particular field was used as a training aerodrome in the early part of the 1914-18 war, the training being carried out on Caudrons.

Stockport, Cheshire. R. REYNOLDS.

At "Acton Aerodrome"

THE letter from "D.P." in your issue of June 9th about an aeroplane in 1907-08 near Hanger Hill, Ealing, stirred up some dust in that cavity which passes for my mind. I remembered a monoplane which attempted to fly at what was then euphemistically called "Acton Aerodrome." I seemed to remember that the pilot or builder was either Walton or Edwardes, who were connected with the Walton-Edwardes "Colossoplane" of later Brooklands days. But while doing some basic research through ancient aeronautical tomes, I found that Lt.-Col. Noel, who was with Handley Page, Ltd., from about 1919 to 1930 or later, was experimenting with an aeroplane of his own at Acton Aerodrome in about 1909, with Messrs. Beney and Lascelles. I lost touch with Noel after 1930, but no doubt Reggie Nicoll of H.P.'s could help your original enquirer there. I do not think this aeroplane could have belonged to Claude Graham-White, as suggested by Mr. Louis Cassera, for Graham-White did not learn to fly, I believe, until the early part of 1910, only a few weeks before his historic attempt on the London-Manchester prize.

London, S.W.3. GEOFFREY DORMAN.

AUSTERITY AIR TRAVEL?

A Reader Criticises "Expensive Frills"

A MAN who wishes to travel from A to B by rail walks to a station, buys a ticket, takes his seat, and reaches B where he once more walks out. The original plan has been accomplished; it was simple.

The same man who does the trip by air first consults a travel agent, meets at a terminal, is busridden and ticketed to an airport; here he is fed and sups tea for half-an-hour, weighed and labelled, and escorted by a neat female through various rooms until finally, to a blare of loudspeakers he is herded into an airliner. But not to sit and read his own paper! Cigarettes, books, newspapers, drinks, cakes, tea, and the inevitable chewing-gum are thrust at him by yet another natty female, while the gold-braided driver saunters up and down chatting; this re-assures him! Imagine the Royal Scot at eighty miles an hour, when in strolls the driver!

Should the trip be broken by a stop to uplift more customers—out to the café for more tea and buns. I have yet to receive free tea at Crewe on the London-Liverpool line.

How long must we wait for the airlines to catch on to the amazing facts that men and women sit quite happily for four or five hours on our normal train services without the attendant bobbing in and out with free tea and buns, books, whisky, etc.?

To the group of men who are at this moment planning to simplify air travel and cut out the expensive frills that constitute false luxury, I personally wish the best of success.

One day the untouchables who run, but rarely use, the country's costly air services will no doubt get round to the idea. THOMAS D. KEEGAN.

Liverpool, 17.

"WATER WITH IT"

Flying-boat Take-offs: Someone is Not Satisfied

HOW does Mr. Lankester Parker (July 7th) reconcile his first paragraph with his last? He states that tide has no effect, and then quotes from his experience that when seaplanes were under-powered he knew that some types would only got airborne *down*wind. Now travelling downwind can only increase *water* speed, which is the same as travelling into tide! Here it would appear that "Flying-boat Flying Instructor's" original explanation (June 16th) is the more accurate.

I suspect that the final answer should come from Saunders-Roe or Short and Harland "boffins"—how about it?

Neath, Glam. INTERESTED.

[Though perhaps not a "boffin," Mr. Lankester Parker surely speaks with the voice of long Short experience?—ED.]

S.O.S. FROM S.A.

Public Library Wants "Flight" Back Numbers

OUR local agents have reported that the following numbers of *Flight* which are missing from our set are out of print and unobtainable:—Vol. 36, No. 1606 (Oct. 5th, 1939); vol. 46, No. 1867 (Oct. 5th, 1944).

As I am greatly distressed to think that our reference files may be permanently incomplete, I am writing to ask your help in securing copies of these issues. Possibly there may be a spare office copy which you might be willing to let us have. If not, I wonder whether you would insert a short request in your journal asking whether any of your readers has any spare copies for sale or as a gift.

If you would do this or if you could suggest any possible source from which I might secure copies, I should be very grateful. We should be very willing to pay the cost of any journals supplied, or expenses for postage.

(Miss) P. M. SPEIGHT,
Assist. City Librarian,
Johannesburg Public Library.

Market Square,
Johannesburg,

[We regret that we are unable to assist; perhaps a reader has an old copy to spare?—ED.]

FORTHCOMING EVENTS

Aug. 17th-27th.—Model Engineer Exhibition, New Horticultural Hall, London, S.W.1.
Aug. 20th.—South Hants Ultra Light Aero Club: Display, Christchurch.
Aug. 20th.—Singapore Air Day and Static Exhibition.
Aug. 21st to 28th.—British Gliding Association: National Gliding Contests, Gt. Hucklow, Derbyshire.
Aug. 21st.—Wiltshire Flying Club and Royal Artillery Flying Club: Thruxton Air races.
Aug. 28th.—Cowes Aero Club: Air Display.
Sept. 3rd.—Association of British Light Aero Club and Centres; Summer Conference, White Waltham.
Sept. 6th to 8th.—R.A.F. Golfing Society: Autumn Meeting and Ladies' Section Championship at Walton Heath Golf Club.
Sept. 7th to 11th.—S.B.A.C. Annual Flying Display and Exhibition, Farnborough.
Sept. 7th.—R.Ae.S. (Luton); "Air Liner Operation."
Sept. 12th to 18th.—Battle of Britain Week R.A.F. "At Home" day Sept. 17th.
Sept. 14th.—Inter-Services Swimming Championships, Seymour Hall, Marylebone, London.
Sept. 15th.—R.Ae.S.; Fifth British Commonwealth and Empire Lecture, "Inter-City Transport Development on the Commonwealth Routes," by E. H. Atkin, F.R.Ae.S.
Oct. 5th.—R.Ae.S. (Luton); Film Show.
Nov. 2nd.—R.Ae.S. (Luton); "Gas Turbine Development."
Nov. 23rd.—R.Ae.S. (Luton); "Brains Trust."
Dec. 7th.—R.Ae.S. (Luton); "Role of Aircraft in Future Warfare," Air Marshal Sir Robert Soundby, K.B.E., C.B., M.C., D.F.C., A.F.C.

AMERICAN NOTEBOOK

By "Favonius"

Convair XP5Y-1 patrol flying boat for the U.S. Navy, shown on the experimental ramp at San Diego, Calif., awaiting its four 5,000 h.p. Allison T-40 turboprops, still under test by the manufacturer. Most conspicuous design feature is the high length-beam ratio hull with warped fore-body lines. The fore and aft blisters are remote-controlled gun turrets.

SEEING THE SPRAY

NEARING completion in the Convair experimental yard at San Diego is the first of two new long-range patrol flying boats for the U.S. Navy. As a matter of fact, the airframe of the first XP5Y-1 boat has been complete for some time and awaits the installation of its power plant—four Allison T-40 turboprops rated at approximately 5,000 h.p. each. The first test flight in a stripped-down condition, without armament or other military equipment, is scheduled in a month or two—which means, presumably, as soon as the power units are delivered.

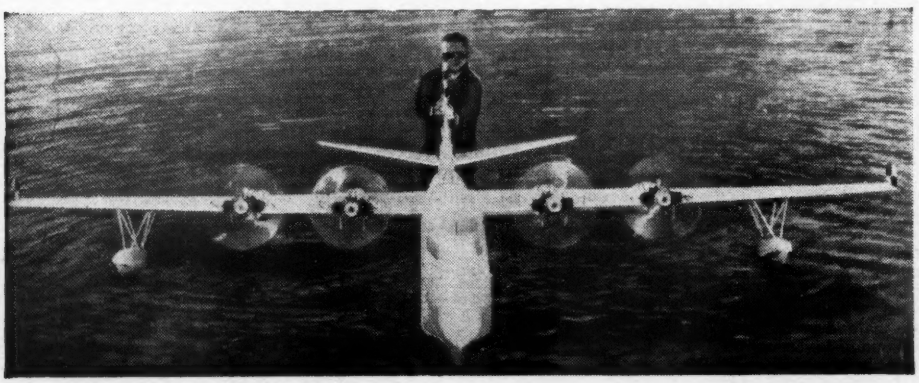
Convair report that the XP5Y-1 is a 60-U.S.-ton (120,000 lb) boat for long-range day and night search of sea areas, rescue operations and anti-submarine patrol. (Unofficial sources say that the gross weight is nearer 140,000 lb). Interior styling and furnishings for crew comfort on long missions improve the operating efficiency. The turboprop power plant, with a total output of 20,000 h.p., will provide quick take-off and long range at high cruising speed—unofficially quoted as 4,600 miles at 210 m.p.h. at 25,000ft, carrying a 20,000 lb bomb-load. An estimated top speed as high as 390 m.p.h. at 25,000ft (a record for a big boat) has also been reported. Approximate overall dimensions are: span 146ft, length 130ft and height 45ft.

Conspicuous for its high length-beam ratio hull, the XP5Y-1 typifies the latest American trend in high performance, long-range flying boat design. Conventional length-beam ratios are of the order of six, but recent N.A.C.A. research has shown that long, narrow hulls with L/B ratios up to 15 can be designed to reduce the aerodynamic drag and the hull structure weight, without spoiling the hydrodynamic qualities. Such high L/B ratios, when combined with long after-bodies and warped fore-bodies (progressive increase in dead rise from step to bow), were found to be markedly superior for rough-water operation. At the same time, the hydrodynamic characteristics in smooth water were not appreciably affected.

Actually, in the XP5Y-1 as now built, the length of the after-body planing bottom is more or less orthodox, unlike a recent Martin boat (the XP5M-1) which does have the rear step extended in a vertical knife-edge to the stern-post. N.A.C.A. tank experiments show that, in general, the hydrodynamic longitudinal stability is improved by increase in after-body length; also that the peak vertical and angular accelerations, and hence the bouncing loads on the planing bottom, can be appreciably reduced during a landing run in rough water. It is possible, therefore, that Convair may eventually follow their East Coast competitor after full-scale trials in open water.

Quite naturally, the Convair hydrodynamicists are equally certain it will be the other way round—Martin and N.A.C.A. notwithstanding. They point out that they have reduced the risk of trial-and-error modification by their own well-developed technique of open-water testing with radio-controlled flying models, dynamically similar in all respects to the full-scale boat. The scale model of the XP5Y-1 boat is complete with four 2 h.p. two-cylinder flat-twin two-cycle engines.

Remote control of the model is performed by a nine-



Radio-controlled XP5Y-1 flying model used in Convair open-water tank testing. The model is dynamically similar in all respects to the full-scale flying boat and is controlled from a full-sized cockpit mock-up at the seaward side of Lindbergh Field. Power is provided by four 2 h.p. two-stroke model-aircraft engines specially designed for the job.

channel radio transmitter installed in a full-scale mock-up of the pilots' cockpit located near the water's edge on Lindbergh Field. Ailerons, elevators, rudder and wing flaps, together with engine controls and ignition system of the model, are all separately controlled from their full-scale counterparts in the mock-up. During a flight test, a motion picture camera makes a photographic record of the model run—more particularly the take-off and landing characteristics, which are of paramount importance in flying boat design.

This highly ingenious model technique and instrumentation is a big change-round from an earlier Convair design philosophy, which believed that a flying boat could be designed and fabricated as a production article straight off the drawing board in ten months flat. This feat was actually accomplished in the case of Convair's Model 131 twin-engined boat some years ago; at least, the prototype was designed, built and flown in that time, but the ensuing hull and tail mods were intriguing to watch as the months rolled by, for spray characteristics are not yet amenable to precise prediction on the drawing board. Finally, we believe that Model 131 was consigned to the aeronautical junk-yard as a white sea-elephant, after being turned down first by the U.S. Navy and then the R.A.F.

It seems likely that this rather expensive lesson in hydrodynamic know-how has been taken to heart by the Convair design team, for the emphasis is now clearly on extensive model research before jumping off the board into deep green water. It is even possible, perhaps, that the pendulum is now swinging a bit too far the other way in the direction of complex instrumentation.

CUT-RATE AERONAUTICS

THE U.S. Civil Aeronautics Administration is finally cracking down on the vendors of non-scheduled air passenger transport—those operators generally tagged as the "non-skeds" in America. (The "regulars" also call them "boot-leggers"!). First to feel a suspension order is Strato Freight, Inc., operators of a Curtiss C-46 Commando in which 53 persons lost their lives off San Juan, Puerto Rico on June 7, shortly after an overloaded take-off for Newark, N.J. Subsequent investigation revealed the overload to be as much as 2,000 lb. There were 81 persons jammed aboard an aircraft originally designed for about 40, or at most 50, so it is not surprising that, when this human sardine-can sat down in the Caribbean in a hurry, only 28 were rescued.

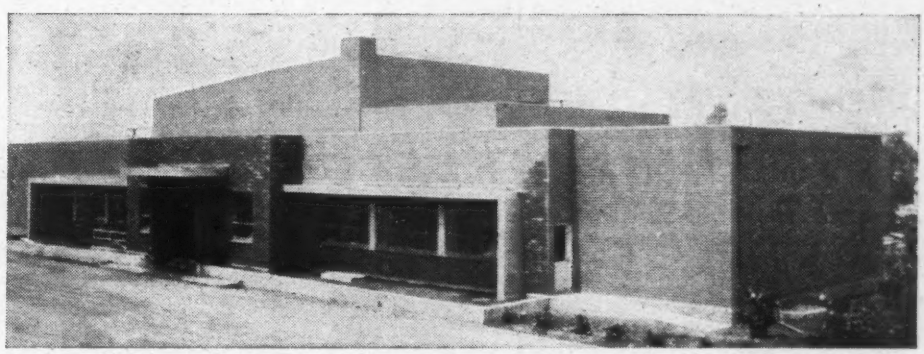
On July 12th, just eight days before Standard Airlines of Long Beach, Calif., had been ordered by the Civil Aeronautics Board to wind up its business because of regulation violations (to wit, running a regular timetable service), a C-46 operated by this "non-sked" carrier flew into the mountains north of Lockheed Air Terminal, Burbank, while making a let-down and killed 36 of its 49 occupants. In this case, Standard Airlines point out that the aircraft was not overloaded, as it was near the end of its run to Los Angeles and thus the fuel load would have been materially reduced.

Then a few days later, a third C-46, operated by Air Transport Associates, another non-sked airline, made the national headlines by crashing shortly after the take-off at Seattle, Wash. In this case the aircraft struck a power line while climbing into the air on only one engine, with the result that it demolished several houses as well as itself. Although the three causes are obviously dissimilar, there can be little doubt that the non-scheduled carriers are now on the official carpet for a show-down and a drastic tightening up of operating and maintenance procedures.

As we see it, the cut-rate airlines have only themselves to blame, especially in California, where certain shoestring operators have been offering flights between Los Angeles and San Francisco (about 400 miles) for less than $10. In this manner they serve only the big cities where lucrative pay-loads can be picked up and they have an unfair advantage over the regular carriers in that they are not required to service, maintain or staff their aircraft under the stringent rules applying to the certificated airlines. In plain language, they have been cutting the overheads with a lower standard of safety.

We recall witnessing, for example, one of these non-skeds operating from a minor Los Angeles airport (notorious for its crowded ground activities and junk heaps), whipping up a cut-rate passenger load, banging the cabin door and waving them off. What the blissfully ignorant, dollar-happy passengers did not know was that the aforesaid door *had* to be banged home with a kick because obviously the door handle was inoperative. This kind of thing may sound a bit trivial, but it is evidence enough that maintenance and safety standards are not up to those of the scheduled carriers with a national reputation at stake.

C.A.B. records show that this latest crash is the sixth fatal accident among the domestic non-skeds this year, claiming a total of 114 lives. In contrast, the regular-timetable airlines are within a week or two of a year's operations without one fatal accident. Even in the previous year, when both types of carrier had several fatal accidents to mar the record, the official statistics show that passenger deaths per 100 million passenger miles were 1.3 on the regular lines and 25.4 on the irregulars. These figures would seem to put the skids under the non-skeds.



The new Western Headquarters Building of the I.Ae.S., recently dedicated in Los Angeles, has the austere look of an atomic-bomb plant. Functional beauty is the motif, the beauty treatment costing $382,000. The auditorium, seating 600, is also strictly functional — "Sleeping Not Permitted."

LAMP IN THE WINDOW

TOP engineering executives of the Pacific Coast aircraft industry paid respectful homage to aeronautical science on July 21st by taking part in a dedication ceremony of the new Western Headquarters building of the Institute of the Aeronautical Sciences in Los Angeles. This new $382,000 edifice—which has all the architectural beauty of an Indian *pueblo*—will provide long-needed facilities for technical activities in an area where the major percentage of America's aircraft are designed, built and flown. The locale is centrally situated for most of the Los Angeles aircraft plants.

Opening off a large central foyer is an auditorium seating 600 for lecture gatherings, with smaller conference rooms and a fair-sized library with a large collection of aeronautical reference material at the disposal of the local aviation industry. The auditorium, by the way, is not

American Notebook . . . . .

Rugged, Reliable and Roomy Luggage-van : The Northrop C-125 Raider assault transport for the U.S. Air Force is designed for the three "Rs" of civil and military transportation. This rear view shows the large ramp door and cargo hold, which can accommodate vehicles up to 6½ft high, 9ft wide and 24ft long. Note the long-span double-slotted wing flaps and retractable ailerons, also the high location of the horizontal tail.

designed for soporific dreaming, for we found the chairs hard-feeling and the rest of the furnishings hard-looking. Doubtless, this is a clever dodge to keep the audience mentally alert—on the old familiar thesis that a tight shoe can make one forget a throbbing toothache. According to the architectural moderns responsible for all this discomfort engineering, we must suffer in silence and genuflect before the throne of functional beauty!

Because no technical meeting in America is considered an unqualified success without considerable gastronomics dinner facilities can be provided for meeting of 400 people. Strangely enough, although we have been attending these mass-production feasts off and on for many years, we cannot recollect ever having had a really tasty meal at any of them. We must cheerfully admit, however, that our American friends appear to enjoy the assembly line technique applied to the human stomach—certainly we have not yet seen any of them rise in revolt against such "take it or leave it" culinary tactics.

Our own personal viewpoint—just in case someone may call down our dyspeptic dialectics—is that Americans have plenty of good food, but some very odd ways of maltreating it. Frankly, we think they could learn a trick or two from Cunard cuisine and service which, oddly enough, happens to be British. Similarly, in the field of comfort engineering, we strongly recommend our I.Ae.S. colleagues to send over a delegation to study the interior décor of the Institution of Civil Engineers' building in Westminster. Here is physical comfort plus true engineering atmosphere. It is the difference, in fact, between a surgical operating theatre and a London club-room.

But to get back to aeronautical science—before, if not behind, the Brass Curtain. The building dedication was followed by a three-day symposium ranging from structural, aerodynamic and navigational problems to guided missiles and atomic-reactor development—such is the strange company in which the aeronautical engineer now finds himself. The guided-missile session was held *in camera* behind the curtain of military security, which left this observer the pleasant alternative of returning home to meditate with Beethoven instead of Mach. But the remarks on atomic energy could be had for the price of a $6 dinner. They were delivered by Dr. Lawrence Hafstad, Director of Reactor Development for the U.S. Atomic Energy Commission.

We suspect that some of our American friends were a bit shocked to hear Dr. Hafstad say that no really new or greatly improved versions of atomic reactors have been built in the U.S.A. since the end of the war; also that the reactor of most advanced design and performance was the joint product of British and Canadian research. Located at the Chalk River, Ontario, plant of the Canadian Atomic Energy Control Board, this reactor (we gathered) uses heavy water for controlling the release of nuclear energy.

Apparently, progress is slower than it might be among the atomic scientists. As is so often the case, the experts are greatly divided. The pessimists, usually the best informed, are staggered by the maintenance and operations problems which would be involved if actual aircraft propulsion devices were to be based on present knowledge, whilst the optimists either are not aware of the difficulties or they are betting heavily on new ideas and new developments. Probably the answer is roughly in the middle.

Observing this witch's cauldron from afar off, one gets the impression that the Canadians have developed a remarkably fine research tool and are actually doing the fundamental and basic research in nuclear fission, while the Americans have concentrated more on the industrial know-how of A-bomb production and stock-piling. (The assembly line again!) If this fleeting impression is anywhere close to the mark, the situation bears a striking resemblance to the civil and military application of the gas turbine in aviation, where the Americans have produced the jet bombers and the British and Canadians are developing the civil transports.

Our closing thought on aeronautical science in the U.S.A. is a plea for free and open discussion in the best traditions of the past. No scientific body can flourish for long if it makes a practice of holding secret court in the furtive atmosphere of the Klu Klux Klan. That sort of thing is not only a negation of the truly scientific spirit in a free world, but is oddly at variance with the cherished American principle of "no taxation without representation." All members supporting a scientific body by dues are entitled to equal treatment and as one of the initiate members of the I.Ae.S., we strongly urge that the light be left burning brightly in the window for all to see. There can be no real cause for black-out curtains in peace time.

H.M.S. "CONDOR" ENTERTAINS

WHEN Royal Naval Air Station, Arbroath (H.M.S. *Condor*), held its recent open day other stations co-operated by providing flying items, since *Condor* is at present fully occupied with the training of maintenance ratings, particularly aircraft artificer apprentices.

After a pre-lunch curtain-raiser by Sea Hornets and Firebrands of a Carrier Air Group led by Lt. Cdr. Law, the crowd of 5,000-odd (whose admission money went to Naval charities) were treated to a thoroughly well-varied programme. Items included formation aerobatics by Lt. Cdr. Law, Lt. Welch and Lt. Bell; some grass-cutting by Lt. Lowder (Hornet); and aerobatics by Lt. Brown from Anthorn, whose Sea Hornet produced wing-tip vortices which startled the uninitiated.

Lt. Cdr. Sproule gave his now well-known yet still unsurpassed gliding demonstration in the Olympia sailplane, Lt. Battison displayed the performance of a Firefly "before" and "after" fitting R.A.T.O., and Lt. Kilburn (Sea Vampire) flew past at lower and yet lower altitudes. Fire-fighting, P.T. displays by the apprentices, joy riding in a Rapide of Air Enterprises, Ltd., a static show—all these and many other items gave the crowd excellent value for their money.

The Meteor and its "mother" make contact over Poole Harbour.

Meteor's 12-hour Flight

Successful Trial of New Air Refuelling Technique

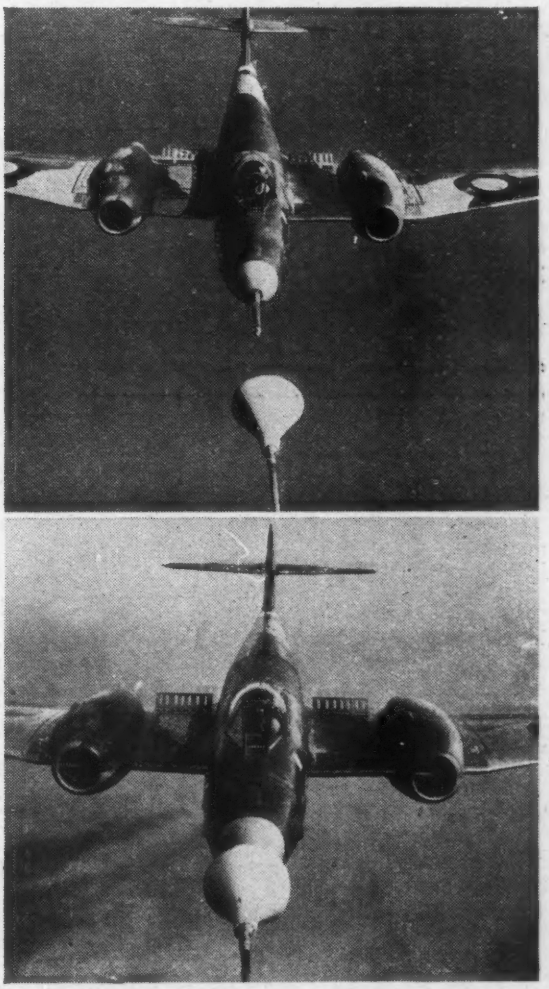
FOR the second time this year an outstanding aviation feat has been permitted by the use of equipment and technique evolved by Flight Refuelling, Ltd. This firm, it will be remembered, made possible the U.S. Air Force's globe-circling non-stop cruise of 23,452 miles, flown in 94 hours by a Boeing B-50 some five months ago.

From Flight Refuelling's home airfield at Tarrant Rushton, Dorset, a Meteor 3 took off at 0700 hr last Sunday morning and remained in the air for 12 hr 3 min. Flying continuously over the South Coast, the Meteor had its tanks replenished in flight ten times from a converted Avro Lancaster, which itself landed twice to refuel.

While this performance has unquestionably set up a record endurance for jet aircraft it is most significant as a completely successful trial of new and greatly advanced equipment for flight refuelling, which thereby gains increased scope for possible military and civil applications.

Sunday's flight was a culmination of a series of experiments which began last April with equipment designed during the previous four months. Simplicity is the essence of the new technique. The tanker aircraft trails a 65 ft fuel-hose which terminates in a conical drogue (so called) containing the main fuel valve. Applying half-flap, the Meteor pilot approaches the tanker and engages with the drogue a "probe" which protrudes from the nose of his aircraft; within the drogue it is gripped by three toggles. Resulting slackness in the hose is automatically wound in by the drum in the Lancaster, and after one turn of the drum fuel begins to flow. Five standard fuel-booster pumps were fitted to the 1,250-gall kerosene tank of the Lancaster used on Sunday, and they transferred fuel at about 100 gall/min.

The two main fuselage tanks of the Meteor (total capacity 325 gall) were filled simultaneously, and the average time from contact to breakaway during refuelling



It will be seen that during refuelling—two stages of which are shown—the Meteor's dive brakes were extended. The flaps, which are normally used, had developed a snag.

Meteor's Twelve-hour Flight . . .

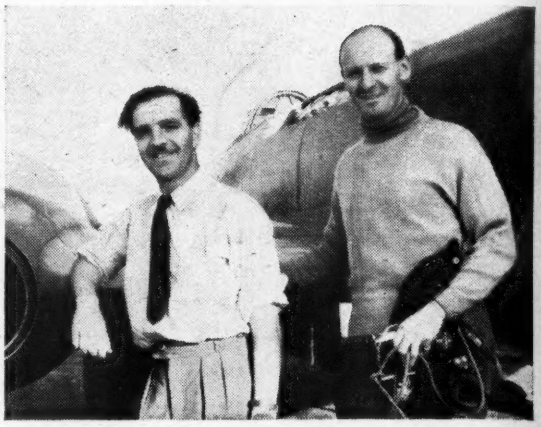
was about 3 min. A transfer rate of 300 gall/min is expected when pumps of higher pressure are available. Breakaway—either in normal conditions or in an emergency—is simple, as the Meteor pilot merely throttles back to extract the "probe."

Poor visibility does not prevent the operation from taking place; both aircraft are fitted with radar and throughout the 12-hour flight kept within radar range of each other—some 100 miles. The Meteor received a total of 2,352 gallons of kerosene in the air and was estimated to have flown 3,600 miles.

It was piloted by Mr. Pat Hornidge, who has been with Flight Refuelling for the past year. Until the beginning of the present experiments he was engaged on the Air Lift, and before joining Flight Refuelling he was a test pilot with the Bristol Aeroplane Company for seven years. Flying the Lancaster tanker was Capt. T. C. Marks, D.F.C.

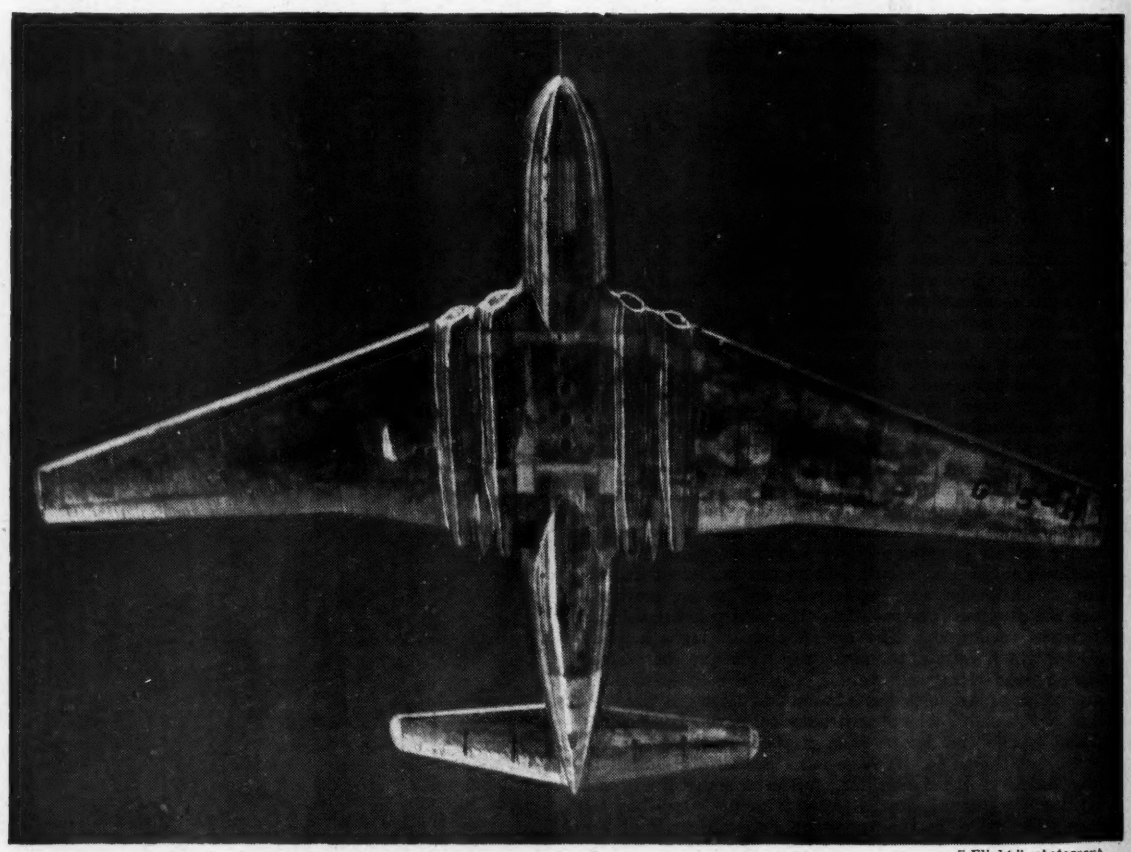
Operational use of the new equipment, it is suggested, would allow jet fighters to be employed for escort duties, or to maintain standing patrols. Although the "probe" fitted to the nosewheel bulkhead of the Meteor used by Flight Refuelling has had no measurable effect on performance, complete cleanness of line could be preserved by the use of retractable refuelling points now being developed.

Since the provision of sufficient tanker aircraft of suitable design to operate with fighters might prove to be a major difficulty, jet bombers and transports may make greater use of the new technique. Either the tanker or the aircraft to be refuelled, it should be noted, could be fitted with the "probe" and thus have to undertake the necessary manœuvring.



Capt. T. C. Marks, D.F.C. (left) flew the converted Lancaster tanker, and Mr. Pat Hornidge piloted the Meteor during last Sunday's demonstration.

GETTING IN THE HOURS : THE D.H. COMET ON TEST

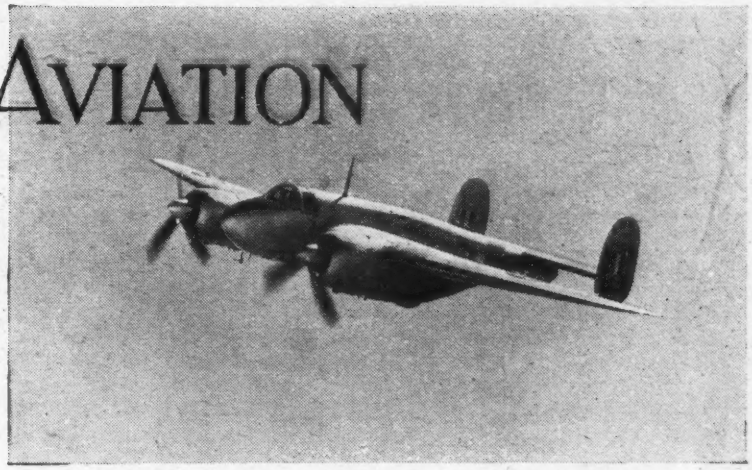


"Flight" photograph

The striking plan-form of the de Havilland Comet transcontinental and transoceanic jet airliner (four D.H. Ghost turbojets) seen to advantage at Hatfield during one of six flights completed between July 27th and August 5th and totalling 5½ hours. That the wing is of generous area, and but slightly swept, will be immediately apparent.

SERVICE AVIATION

Royal Air Force and Naval Aviation News and Announcements



BRIGAND'S BROTHER: Most powerful of the Service trainers, the Bristol Buckmaster has a number of features in common with the newly introduced Brigand B.1 bomber.

The Queen's Appointment

THE Air Ministry announces that Her Majesty The Queen has graciously accepted the appointment of Honorary Air Commodore of No. 600 (City of London) Squadron, Royal Auxiliary Air Force, and No. 2600 (City of London) Light Anti-Aircraft Squadron, Royal Auxiliary Air Force Regiment. His Majesty The King has approved the appointment.

Former Honorary Air Commodores of No. 600 Squadron have been the Rt. Hon. F. C. Guest (1931-37), Air Commodore Lord Lloyd (1937-42), and Sir Archibald Sinclair, since 1942. No. 600 Squadron is commanded by Squadron Leader D. E. Proudlove and is based at Biggin Hill. There has been no previous appointment of an Honorary Air Commodore to No. 2600 Light Anti-Aircraft Squadron of the R. Aux. A.F. Regiment, which is commanded by Squadron Leader A. G. Collings and was formed two months ago. It is based at Stanmore, Middlesex. The Squadron's town headquarters are at Finsbury Barracks, E.C.

Formed in August, 1925, No. 600 was the first of the Auxiliary Air Force Squadrons. It was mobilized during the Munich crisis of 1938, and again several days before the outbreak of war in 1939. At that time it was operating from Northolt, equipped with Blenheim night fighters, and helped in the development of airborne radar. By the end of the war the squadron claimed 165 enemy aircraft destroyed, 13 probably destroyed and 34 damaged. During the German invasion of the Low Countries, the squadron temporarily transferred to day operations, its first mission in this role being an attack on Rotterdam airport. It reverted to night fighting, and by 1942 had destroyed 17 enemy aircraft. Soon afterwards it was re-equipped with Beaufighters and moved to North Africa.

Before crossing to Sicily in June, 1943, the squadron shot down 38 more aircraft, and while on the island accounted for a further 42. The squadron was active during the Salerno and Anzio actions, and continued its successful night operations during the advance into Italy. At one period its pilots destroyed 14 enemy aircraft in two nights.

No. 600 Squadron is at present equipped with Spitfires.

Air Lift Slackens Off

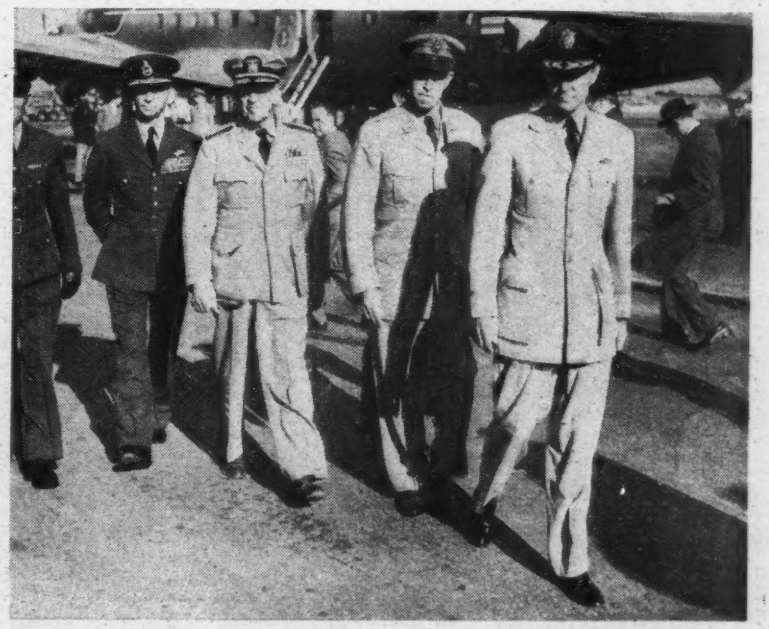
FROM August 1st the Berlin Air Lift is being reduced in intensity and the operation may eventually cease altogether. Certain U.S. Army and Navy transport units returned to America last week. A joint memorial service was held at Fassberg on July 29th (see picture on page 154) for the 39 British (including passengers) and 31 Americans killed on Air Lift duty.

The Fighter Control Branch

A SEPARATE Fighter Control Branch has now been set up in the R.A.F. because the skill and technical knowledge needed can only be acquired by full-time employment in the fighter control and raid reporting organization. It will offer permanent commissions to members of the R.A.F. and W.R.A.F., as well as commissions to young men during the period of their National Service.

For Imperial Defence College

THE following R.A.F. officers have been selected for the 1950 course at the Imperial Defence College, which will begin on January 10th next: A/Cdre. H. L. Patch, C.B.E., Commanding Officer of the Aeroplane and Armament Experimental Establishment, Boscombe Down, Wilts; A/Cdre. J. R. Whitley, C.B., C.B.E., D.S.O., A.F.C., Director of Organization (Establishments), Air Ministry; A/Cdre. G. L. Worthington, C.B.E., Director of Equipment (B), Air Ministry; G/C. F. J. St. G Braithwaite, C.B.E., Senior Officer in Charge of Administration, Air Headquarters, Malta;



JOINT CHIEFS: When the U.S. Joint Chiefs of Staff arrived at Northolt last week they were met by Marshal of the R.A.F., Lord Tedder (left). The American chiefs (l. to r.) are Admiral Louis E. Denfield, U.S. Navy, General Omar N. Bradley, and General H. S. Vandenberg, U.S. Air Forces.

Service Aviation . . . . .

G/C. J. H. Edwardes-Jones, C.B.E., D.F.C., A.F.C., Central Fighter Establishment, R.A.F.; G/C. J. M. Cohu, C.B.E., R.A.F. Station, Brize Norton; G/C. A. Earle, C.B.E., Senior Personnel Staff Officer, Technical Training Command; G/C. G. N. E. Tindal-Carill-Worsley, C.B.E., Deputy Director of Technical Administration, Air Ministry.

The object of the I.D.C. course, which normally lasts a year, is to train senior officers of the Commonwealth fighting services and civilian officials in the broadest aspects of imperial strategy. Selection of R.A.F. students is normally restricted to air commodores and group captains. The college is at Seaford House, Belgrave Square, London, S.W.

Fourth Britannia Shield Contest

FOR the past three years a feature of the Battle of Britain Week celebrations has been the competition for the Britannia Shield among Service sportsmen from nations whose armed forces took part in the Battle or were assembled on British soil between 1940 and 1945.

Five nations—Belgium, France, the Netherlands, Norway, and Great Britain (represented by the R.A.F.)—took part in last year's competition, and the same five, with the probable addition of Greece, will compete again this year. The teams will be accommodated during Battle of Britain Week at R.A.F. Station, Uxbridge, where they will arrive on September 22nd, receiving an official welcome there on the following morning. As in the past two years, the contests will culminate in the boxing finals and the presentation of the shield in the Empire Pool Arena, Wembley, on Friday, September 16th. This year the shield will be presented to the winning teams by the French Ambassador. Other events will be the cross-country race from R.A.F. Station, Halton, Bucks, on the Wednesday afternoon, the fencing and the boxing preliminary bouts and semi-finals at R.A.F. Station, Uxbridge, on the same day, and the shooting at Bisley on the Thursday morning and afternoon, followed by the swimming at Eltham Baths, S.E.9.

Appointment

THE Air Ministry announces the appointment of Air Vice-Marshal Douglas Macfadyen, C.B.E., as Assistant Chief of the Air Staff (Policy) at the Air Ministry, from August 1st, 1949.

Air Vice-Marshal Macfadyen has been Director of Plans at the Air Ministry since last January, after attending a course at the Imperial Defence College. At the outbreak of war he was commanding No. 105 Squadron, Advanced Striking Force, and in January, 1940, was engaged on administrative planning duties at Headquarters, British Air Force in France. In July, 1940, he was appointed to the Directorate of War Organization at the Air Ministry, and during 1941 and 1942 he commanded in turn the R.A.F. Stations at Chelveston, Northants, and Mildenhall, Suffolk. He served on organization duties at Headquarters, Eastern Air Command, from November, 1942, and at Headquarters, North-West African Air Force, from March, 1943. Returning home at the beginning of 1944, he was appointed Director of Policy (Air), and in October, 1945, Director of Policy. He became Commandant of the Officers' Advanced Training School at R.A.F. Station, Digby, Lincs, in August, 1946.

Seletar Regatta

THE fourth post-war regatta of R.A.F. Seletar Yacht Club attracted over 80 entries. In addition to those from the Seletar club there were participants from the R.A.F. Changi Yacht Club, the Naval Sailing Club and the Far East Land Forces Sailing Club, Singapore, and the Royal Singapore Sailing Club. The Seletar club has 200 members, owns 50 sailing boats of all kinds, and has an attractive club-house overlooking the Straits of Johore. The majority of the members are airmen, serving at the R.A.F. maintenance base at Seletar, but airwomen are taking an increasing interest in the sport.

There were nine races in the regatta and in all but two events R.A.F. competitors gained either first or second place. Lady Lloyd, wife of Air Marshal Sir Hugh P. Lloyd, C.-in-C. Far East Air Force, presented the prizes.

Testing Overseas Airfields

THE Air Ministry Works Directorate has almost completed a comprehensive testing programme to determine the runway strength of overseas airfields. During the war hundreds of airfields were built in various parts of the Commonwealth and Empire. They were constructed rapidly, to *ad hoc* specifications, of such materials as were available locally, and were adequate for the immediate wartime requirements. With the introduction of larger aircraft and the development of peacetime air routes, it became necessary to determine accurately the bearing strength of certain of these airfields, and thus ascertain what types of modern aircraft could use them in safety. The task was given to the Air Ministry Works Directorate, and during the past 18 months the runways of more than 60 overseas airfields in nearly 20 different countries have been tested.

Testing is done with a special machine developed by Air Ministry engineers. This is a bridge-like structure with side ramps on which lorries are driven to provide the load. The machine can take a total load of 40 tons, but is normally loaded at about 25 tons, the weight being transmitted to the runway surface through a jack and bearing plate. Bearing plates of different sizes can be fitted to represent the contact area of different sizes of aircraft tyres. Runway surface deflection caused by the load is measured, and other effects noted. The machine is made of light alloy, and can be dismantled into small sections for air transport.

Reunions

IT is intended to hold a reunion on October 14th of all who served as officers or aircrew in No. 92 Squadron. Applications should be made to W/C. J. A. Kent, Experimental Flying Department, R.A.E., Farnborough, Hants, before September 15th.

* * *

No. 2 A.D.U. (M.E.) is holding its third Reunion Dinner in Manchester on September 24th. Former members who wish to attend should write to H. H. Wynn, "Llangorse," Legh Road, Knutsford, Cheshire.

COUNTY CAMPERS: Officers of No. 605 (County of Warwick) Squadron, R.Aux.A.F., with one of their Vampire 1s at Sylt, N.W. Germany, during their 15-day annual camp. From left to right (front row) are F/L. J. Timmis (flight commander), S/L. R. C. T. Goodwin (C.O.), and F/L. J. Button, D.S.O., D.F.C.

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